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# the Iron Age

V. OF MICHIGAN

MAR 6 1952

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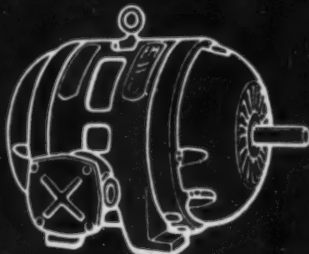
THE NATIONAL METALWORKING WEEKLY

March 6, 1952

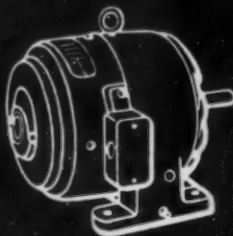
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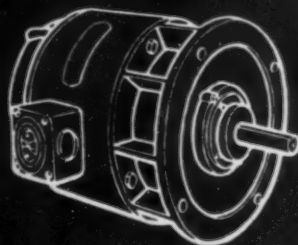
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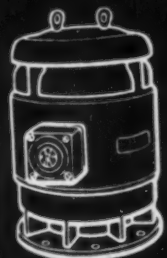
stand to gain much in dealing with your Fairbanks-Morse Branch or Dealer as the single source for *all* electric motor requirements. Not the least are the benefits of undivided responsibility, unprejudiced advice and application assistance. For your copy of the handy "Pocket Panorama" which illustrates the complete line . . . write Fairbanks, Morse & Co., Chicago 5, Illinois.



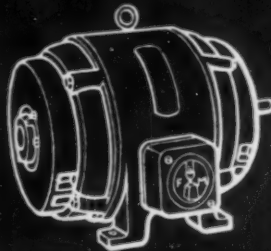
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**a name worth remembering**

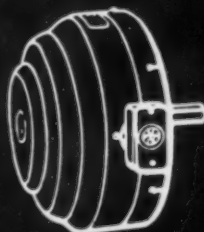
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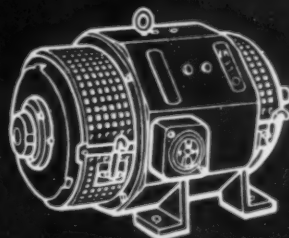
Vertical Motors



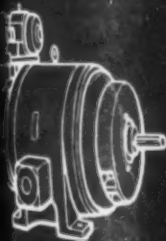
General-Purpose Ball-Bearing Motors



Axial Air Gap Motors



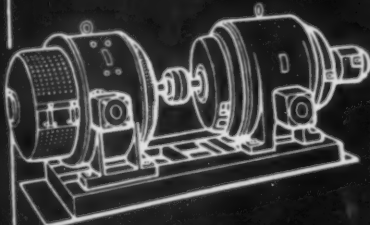
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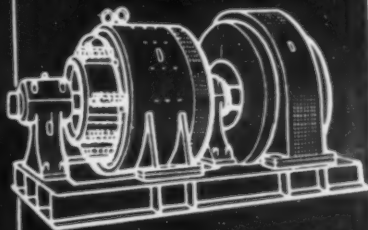
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Low-Speed A.C. Generators



Motor Generator Sets



Frequency Changer



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Catalog 400 replaces our old Catalog 200. Its 180 pages illustrate and describe each model in the complete line of Cleveland Worm Gear Speed Reducers. It contains engineering data on each type, including dimensions, weights and horsepower capacities—all the information you need to arrive at proper selections of drives for any equipment.

Over a year in the making, Catalog 400 is now available to all our customers. If you can use one in your work of designing power-driven equipment, or selecting speed reducers for new or old machines, just drop us a line on your letterhead.

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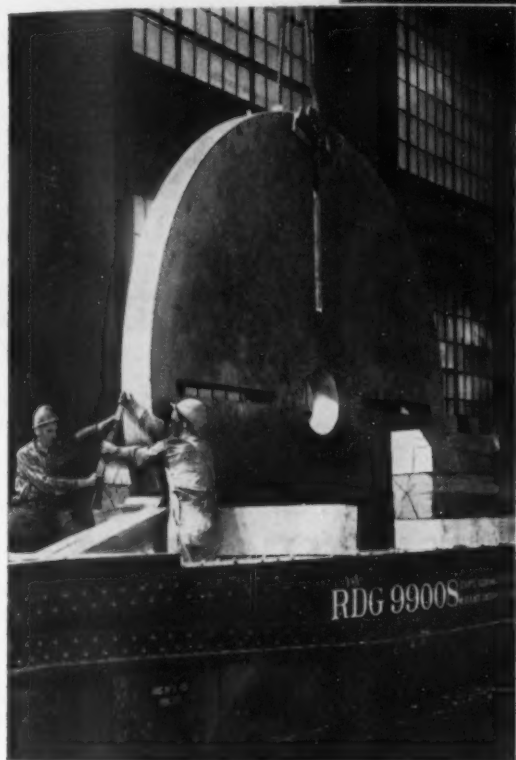


**CLEVELAND**  
Worm Gear  
*Speed Reducers*



Shafts for hydroelectric installations. The one at the left is 18 ft long; the other, 24 ft. Diameter of axial bores, 12 in.

Chipper disc used in wood-pulping. OD, 175 in.; ID, 20 1/2 in.; thickness, 10 1/2 in.



## HERE ARE SOME *Bethlehem* HEAVYWEIGHTS

There's plenty of tonnage packed together in these big forgings . . . 35 tons in the disc, 100 and more in the two flanged shafts, and better than 12 in the boring mill spindle. From a standpoint of weight, that heavy-walled spindle is the baby of the group, but it's still a husky forging.

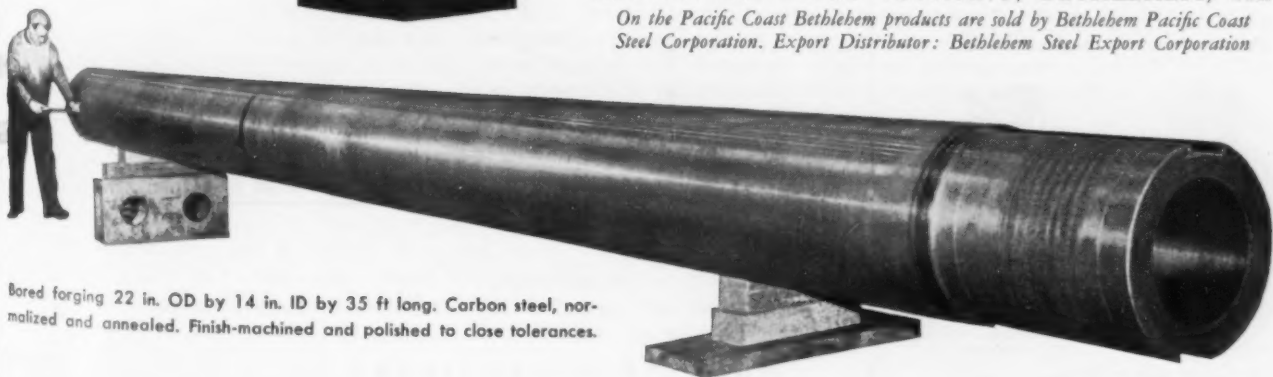
Almost any time you'll find pieces like these on the floor of our shops. But the heavyweights are only one class of forgings produced in great volume at Bethlehem. We make the little fellows, too—some so small you can cup them in your hand.

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# IRON AGE

MARCH 6, 1952  
VOL. 169, No. 10

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THE IRON AGE

# DIGEST

## of the week in metalworking

### YOU MAY GET MORE NONFERROUS METALS

PAGE 163  
Nonferrous supply seems to be easing. Aluminum and copper are still tight. But zinc is easing and lead has relaxed to the point where NPA withdrew some control. World copper price is slipping but it remains the tightest metal. Cutbacks in aircraft schedules may develop aluminum soft spots.

### OIL COUNTRY GOODS AT RECORD DEMAND

PAGE 165  
An Iron Age survey reveals that demand for oil country goods is at a pinnacle. All producers, especially seamless mills, are working at capacity. Backlogs are as high as CMP will permit. The oil industry is drilling at a feverish tempo and is using foreign steel, conversion to help out.

### U. S. REVISES WHOLESALE PRICE INDEX

PAGE 166  
Separate from the Consumer's Price Index which covers cost-of-living increases in wage contracts, the Wholesale Price Index of the Bureau of Labor Statistics has been revised. It greatly increases price coverage, especially in machinery and textile groups. New base period is 1947-1949.

### SHORTAGE-STRUCK SCRAP SUPPLY STIRS

PAGE 167  
Bated breath of scrap iron and steel buyers has been relaxing into a sigh of relief. Bitter scrap battles of winter have been fought and won. Supply has become easier. Even winter's last blow, heralding lionlike entrance of March, will not cause too much trouble. Stockpiles have improved.

### YOU CAN APPLY FOR MORE STEEL TO NPA

PAGE 168  
NPA is trying to feel out the extent of softening of demand for some steel products. It declared a special dividend in allocations of three types—but with reservations. Makers of specified civilian items may apply for up to 10 pct more sheet, strip, blackplate for use in the first quarter.

### QUOTA HIKE HOPE CHEERS AUTO INDUSTRY

PAGE 186  
Automakers were encouraged by NPA predictions that second quarter auto production quotas will be increased from 930,000 to 1 million units. Detroit thinks it can sell all the cars it can make. The serious unemployment problem will be softened with quota boosts. Copper is a tall hurdle.

### NPA SPREADS OIL ON TROUBLED WATERS

PAGE 193  
The machine tool industry has been reassured by NPA that mounting order cancellations do not mean that the bottom is dropping out the tool market. Decreased emphasis on equipment the Air Force considers obsolete has caused the trouble, NPA says. New orders will total \$1 billion in 1952.

### DIAMOND WHEEL SHORTAGE: WHAT TO DO

PAGE 203  
More of the diamond wheels used for grinding tools and parts will be needed in 1952-53 than in peak World War II years—but diamond bort imports will be down one-third. Electrolytic-mechanical techniques, dust reclamation, improved wheel bonding and new coolants will stretch supplies.

### PLAN SALVAGES 78 PCT OF CARBIDE SCRAP

PAGE 208  
Weekly collections of all worn and broken carbide tools, including fragments of broken tools, provide the stockpile for this thorough salvage plan. Some are ground and re-used. Tips from the rest are added to fragment stock, and are used to tip small tools, make scriber tips, used in gages.

### TOOLING, HANDLING IN BALANCE MACHINE

PAGE 217  
All counterweights and checks on the V-8 crankshaft are machined. The usual unbalance of 20 oz.-in. in each end of the V-8 crank has been reduced to 0.025 oz.-in. by De Soto using an automatic balancing machine built by Gisholt Machine Co. Loading, weighing, drilling and transfer are automatic.

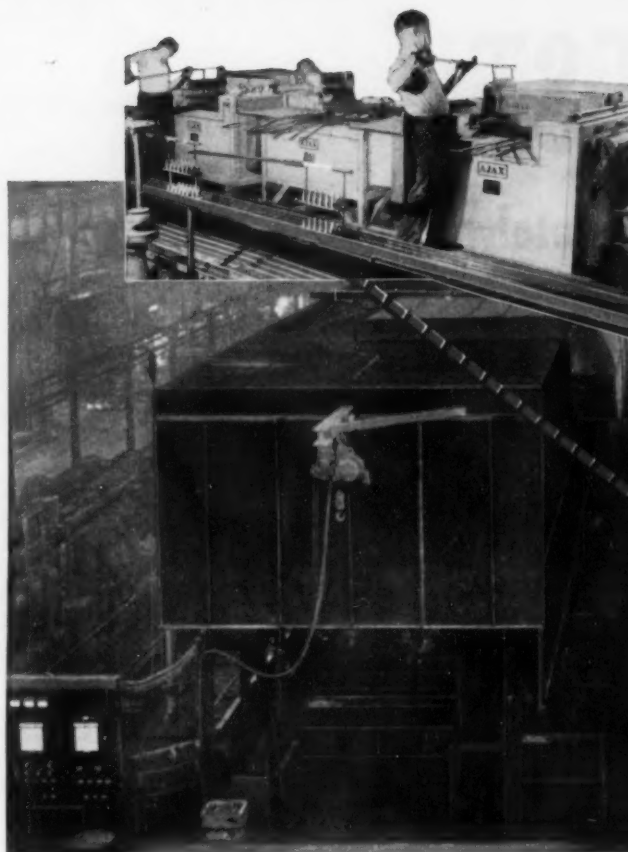
### HOW MUCH EASIER WILL STEEL MARKET GET?

PAGE 309  
Even the doubters in Washington now admit that the steel market is generally easing. Question now is how easy will steel get? Big producers are comfortably booked through second quarter; but they expect ingot rate to decline later. Secondary mill products are next to be decontrolled.

### BETTER MATERIALS FOR NUCLEAR REACTORS

NEXT WEEK  
Reactor materials must meet high physical and thermal requirements. Titanium, zirconium and beryllium offer possibilities as construction materials. Bismuth, lead, potassium sodium may make liquid metal coolants. Ceramics, ceramic-metallics have unusual high temperature properties.





From the batch type installation at the left martempering base detonator fuses, to the huge mechanized furnaces austempering automobile bumpers illustrated below, Ajax Electric Salt Bath Furnaces are replacing old-style quench and temper methods for a wide variety of steel products.

From ring gears to plow points . . .  
 From bearing races to cast iron cylinder sleeves . . .  
 From uniformly shaped metal parts to odd and irregular sizes . . .

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Write for Ajax Bulletin 120

**AJAX ELECTRIC COMPANY, INC.**  
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# AJAX

## ELECTRIC SALT BATH FURNACES

In Modern  
 Heat Treating—  
 the Trend  
 is to  
**MARTEMPERING**  
 and  
**AUSTEMPERING**

## Tools Are Security!

**T**HERE was good reason why the Village Blacksmith used to get top billing in stories and poems. On him depended many things. He was called upon to help build homes, make rifles, maintain transportation and for many other special jobs.

One might say that he was responsible for civilian security and military supremacy; he played an important economic role. The Blacksmith is well remembered because he has a counterpart today.

Today we must arm for peace. We must take our gigantic American way and make room for military preparedness and still keep business going at a level which will support these enormous costs.

There is only one way to make real gains in our living standard: We must make more at a lower cost per unit—be it military or civilian work.

If another wage round is passed on in terms of higher prices all along the line, more inflation will follow. Industry knows this better than anyone else; industry knows too that it never is able to pass on the full impact of the wage increases which are wrung from management by union power—power gained by political association and strike threats.

The extra savings which mean the difference between profit and loss must come from better tools. They must come from abandonment of tools and machines which no longer justify themselves in cost savings. More than ever such tools and machinery must pay for defense costs, higher wages, pension plans, government inefficiency and the growing burden of national, state and local taxes.

Fortunately, American industry has tool engineers well qualified to solve these problems of increasing production and cutting costs. If it didn't have them this nation would be a pushover for more and more socialism—and finally, for communism.

In this special issue we stress "Tooling for Security," the theme of the Industrial Exposition of the American Society of Tool Engineers which will be held in Chicago, Mar. 17-21. On pp. 203 to 228 you will find information by, for, and about tool engineers—useful hard-hitting articles on this important field.

*Tom Campbell*

Editor

*"What  
clue  
to quality  
can they  
offer  
you?"*



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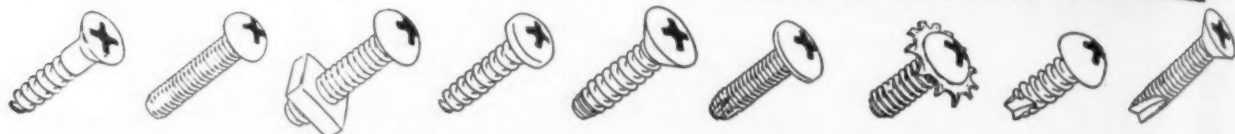
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THE FASTENERS OF TODAY . . . AND OF THE FUTURE



# Dear Editor:

## Letters from readers

### Management Rights

Sir:  
I would most certainly appreciate your kind permission to reproduce in one of our forthcoming issues "Who Has The Right To Manage?" by J. B. Delaney, which appeared in your Jan. 24 issue.

M. FRIEDLANDER  
Editor

Foreman's Digest  
Mystic, Conn.

### Alcoholism

Sir:  
As a former alcoholic I was very much interested in your article "Alcoholism: Costs Industry Too Much" by G. G. Carr appearing in your Feb. 21 issue.

I went through most of the stages listed on your chart including the loss of a couple of jobs.

It was while with my present company that I was first introduced to clinical treatment of alcoholism. I went through a clinic to which the company made a financial contribution. I think it cured me.

I think you should tell more about the availability of these clinics and spread this knowledge with the idea of reclaiming a lot more alcoholics.

A. A.

We are researching now for a followup on this article from the company and community level.—Ed.

### Auto Steel Data

Sir:  
In reviewing the Metal Industry Facts presented in your publication of Jan. 3 it was discovered that the information relative to the "Steel In Passenger Car" as stated on p. 437 did not agree with the steel shipped to the automobile industry as stated on p. 438.

Hot-rolled sheets and strip used in a passenger car is given as 1652 lb while cold-rolled sheets and strip per car is 964, indicating that cold-rolled represents approximately one third of the flat-rolled product used in a passenger car. However, the steel shipped to the automobile industry which totaled 2,314,000 hot-rolled sheets and strip and 4,031,000 cold-rolled sheets and strip would indicate that the cold-rolled used in an automobile represents two thirds of the flat-rolled product.

Based on our own experience, this latter percentage of two thirds is correct, thereby indicating some discrepancy in the figures given on p. 437. We will appreciate your confirmation of the fact that the usage

figure for cold-rolled product should exceed that of hot-rolled.

H. E. SIMONS  
Acting Mgr., Planning Dept.  
Steel Div.  
Ford Motor Co.  
Dearborn

We have found it difficult to reconcile the figures given us by various sources on requirements for a car. In some cases the requirements as stated include a certain number of service parts which are automatically run with the new models. This tends to inflate the figures. Where the manufacturer buys the part from the outside he can only weigh the finished part, estimate the amount of steel in the part and add something for scrap losses.

A card in our records (supplied by the purchasing department of a large automobile company) shows the rough weight of hot-rolled carbon sheet required for a 2-door sedan as 1238 lb, and cold-rolled carbon sheet requirement of 934 lb.

We have never been able to reconcile steel shipments to the automobile industry with steel requirements per car. There are many difficulties in classification. You can readily understand the difficulty, for example, of segregating General Motors' purchases which include, in addition to automobiles, a large tonnage for appliances, electric locomotives and many other items.—Ed.

### Power Transmission

Sir:

The department believes that the articles "Power Transmission Through Chain Drives" by John E. Hyler and "Metallizing Cuts Marine Maintenance Costs" by Capt. Fred M. Earle, USN, in your issue of Jan. 31 will be useful to the government's overseas information program. It therefore asks your permission to reprint and distribute these articles through its information officers abroad to foreign magazines or newspapers in continental Europe, Latin America, the Middle East, the Far East, Africa and to the French language press in Canada for republication.

Because the acute paper shortage in many overseas areas often makes the placement of lengthy articles rather difficult, we ask the privilege of abridging (not digesting or re-writing) articles when necessary.

R. MOCH  
Chief, Field Publications Unit  
U. S. Dept. of State  
New York

Sir:

Your Jan. 31 issue carried an article on "Power Transmission Through Chain Drives," No. 2 of a series by John E. Hyler. We are interested in obtaining six reprints of this series and also six reprints of the No. 1 series.

L. H. WHITNEY  
Chief Engineer  
Whitney Chain Co.  
Hartford

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*This magnet averaged less than \$5 a year!*



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CHESTER BLAND, *President*

**ohio**  
ELECTRIC

A-2012

## THE IRON AGE Newsfront

► The electrical equipment industry is growing at a rate three times that of industry generally. Westinghouse statisticians, noting that during 1950 new electrical equipment capacity was added six times as fast as the average of the 1935-1939 base, estimate the growth rate at 7 times in 1955, 10 times in 1965.

► Robot controlled machine tools are not a futuristic dream. One type previously mentioned on this page as being sponsored by a well-known lathe builder has aroused tremendous interest. A large automobile manufacturer, among others, is actively seeking a chance to try out the device.

► For more than a month, manufacturers of TV sets and appliances have been talking optimistically about business prospects and reduction of their inventories. A check with shops that make parts for these companies shows that this optimism has been backed up with cash. A number of these parts suppliers now report they are doing more business than they have at any time since last April.

► Commercial jet airliners in the U. S. will be postponed until the military starts getting jets as fast as it wants them. After that they may come very quickly, but that time is well over a year away. When military jets are really rolling, the engine builders will want to keep their plants busy. Otherwise commercial jets will be impossible without subsidies.

► Tests on artillery shell rotating bands made from 99.97-pct pure iron tubing have shown some very promising results. Tubing has been made in Italy for some years at a cost said to be competitive with that of electric furnace steel tubing.

► More efficient use of metals is constantly reducing the amount of scrap that can be expected from industry. Use of powder metal gears, for instance, saves General Motors about 64 pct of what would otherwise be scrap. Main scrap reduction, however, still comes from more efficient purchasing and use of sheet and strip steel.

► A complete study of the moderate temperature belt's possibilities for sales of heat pumps is now being made. The pumps, which provide winter heating or summer cooling, are being tried in a number of places. Large scale use will require considerable expansion in electric power facilities.

► The Office of Price Stabilization is worried about non-compliance with regulations. It finds that in one area only 18,000 out of 52,000 potential establishments in the service category (CPR 34) have filed price lists. Deadline was last June 15.

► Among patents on which the Atomic Energy Commission will grant free licenses is one recently released on a pipe extractor. It contains a "novel clamp suitable for extraction of vertical pipes" from inaccessible locations. The clamp, which hangs from a single cable, is remotely operated.

► References in the Feb. 21 Iron Age to TS 4140 steel being "excessively brittle" should have been qualified. This brittleness is only apparent at sub zero temperatures. For ordinary applications the TS 4140 has impact strength equivalent to the standard 4140 series.



# signs of

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These three steel warehouses normally carry in stock the complete range of cold rolled strip steel specialties made by The Cold Metal Products Company, including low carbon and high carbon analyses, tempered spring steel and stainless grades in the 300 and 400 series. Supply problems are now very difficult. Currently, shortages exist in some grades and sizes, but within the limits of inventory possibilities strip steel fabricators continue to find justification for the descriptive phrase long identifying all Precision produced CMP products—"More feet per pound—more finished parts per ton."

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# NONFERROUS: Biggest Bogie Fades Away

Some metals show signs of easing . . . Lead freer, controls being relaxed . . . World copper price slipping . . . Actual aluminum demand unknown . . . Scrap better—By R. L. Hatschek.

The nonferrous metal markets are definitely following the trend set in steel. Some items are already soft and others show signs of getting soft—but the whole picture is dependent on what changes in the control picture come out of Washington. Aluminum and copper are still very tight while zinc is easing and lead has relaxed to the point where National Production Authority has already eased the control bite.

M-93, which restricted the types of batteries that could be made, was revoked last week. M-38, the general lead order, was modified by elimination of end use restrictions. (See p. 172.) These moves resulted from increased supplies of the metal which also caused world prices to dip down to the U. S. ceiling price of 19¢ per lb. Despite this, and the elimination of the import tariff, buyers were hesitant to take on more lead.

Zinc is a little behind lead on this same path. World prices are falling but still aren't down to domestic ceilings. Demand still exceeds supply. And galvanized steel is still tight even though flat-rolled steel is easier to get than it has been for some time. Bigger March allocations of zinc indicated the improved availability.

**Copper Tightest**—Copper seems to be toughest of all. Right now, lack of it is limiting production of many consumer goods for which other materials are in fair supply. Automobiles are the prime example—Detroit can get steel enough for far more cars than copper supplies will permit the industry to make.

Government officials have urged industry to switch from copper to other materials in all possible places. The copper shortage has been called "permanent" and "long term." The copper producers disagree with this view and are expanding production facilities as fast as they can. To be sure, some of these new facilities will be marginal and high-cost but the country will benefit from increased domestic supplies.

One of the factors making the copper outlook so bleak is that the shortage is worldwide. World prices are about 54.5¢ per lb as

compared to a U. S. import ceiling of 27.5¢ and they have been that high for many months. But resistance to that peak is growing and tonnages sold at 54.5¢ are diminishing. Some copper users in this country are confident of greater supplies later this year. Supplies, however, will not be ample despite all the optimism.

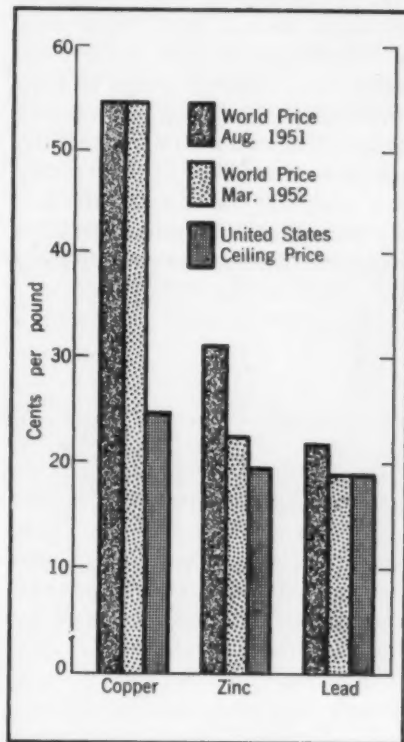
Aluminum is in a unique position among the major nonferrous metals—it is relatively new. Production of this metal has not nearly reached the stage of others which are so difficult to expand. The current program of doubling the 1950 capacity in 3 years illustrates this. Output today is at a monthly rate of about 80,000 tons.

**Real Demand Unknown** — It would be very difficult to predict for any metal the overall demand that would show up if controls were eliminated. But aluminum demand would be impossible to predetermine. This metal has never had a true test of a civilian market under normal conditions. Many production and fabrication techniques have evolved since 1939: many new products and uses for the metal are as recent. And now the added burden of substitutions for other metals is being put on the list.

Cutbacks in the military program have a profound effect on aluminum because of its importance in aircraft. The current reduction in aircraft schedules coupled with zooming output of the light metal may well result in soft spots in the market if Washington does not soften controls.

Civilian industry has been allotted only 30 pct of its base period use of the metal for the second quarter. This compares with 30 pct of brass mill products and

Nonferrous Metals Prices



HOW MUCH?: Comparison of world and U. S. prices for major nonferrous metals.

Turn Page

## TOOLS: How Subcontracting Works

**Machine tool builders have trouble finding subcontractors with necessary facilities, know-how . . . Tooling, raw materials, supervision are the big headaches—By E. C. Beaudet.**

Hard-pressed machine tool builders are turning more and more to subcontracting to boost their production rates. One of the fastest means of boosting machine tool output, it is not without its attendant problems.

Subcontracting, now said to account for over 20 pct of tool production, is expected to reach from 30 to 35 pct by the end of the year. Whether or not this figure will be reached depends on availability of proper facilities. The high precision work required narrows down the number of eligible subcontractors considerably.

For the subcontracting of complete units an industry basically close to that of machine tools is required. Among the most successful in this field have been producers of printing, textile, and carton-making machinery. The low level of business in the textile field has resulted in an increase of inquiries from textile equipment manufacturers.

**Only The Beginning**—After a subcontractor with the necessary equipment has been found the problems have only started. A check of machine tool builders reveals their number one subcontracting problem to be tooling.

Economical high production is difficult to obtain unless tooling duplicates that of the builders. This means builders must supply a good part of the jigs or fixtures or arrange for new ones to be made. All this is a time-consuming and painstaking process.

With tooling completed builders have to guide production and provide complete data on each job. The subcontractor must be educated to the most efficient and economical shop practice. A lot of this does not show up in the blueprints. Variations from drawings that builders have been doing in their own shops for many years have to be pointed out to subcontractors. With thousands of parts to be made this becomes a formidable task.

**Still More Problems**—Other factors compounding subcontracting problems include the proper flow of subcontracted parts and components into builders' shops to keep production schedules in various departments running smoothly, seeing to it that the subcontractor has adequate raw materials and the difficulty in handling detailed problems when subcontractors are located at remote distances.

The present trend in machine

tool subcontracting seems to be toward more building of complete units wherever possible. Such work enables the builders to keep a better balance in their own shops. Companies capable of building complete units are anxious to get it to keep assembly as well as production facilities occupied.

### Forges Titanium Successfully

Quantity production of titanium bar forgings for industry and defense is now carried on by Kropp Forge Co. following 14 months of research. Research at Kropp is being expanded to include product development for itself as well as for firms interested in products for jet aircraft engines and the automotive field.

Roy A. Kropp, president of the company, said that difficulties in forging titanium are often similar to those of stainless steel. To afford desirable qualities, titanium must be alloyed and each new alloy creates a new forging problem. Many such alloys are still in the development stage.

Open die forging of shaped rings, blanks and bars originally presented serious problems but Kropp has recently turned out forgings in these shapes successfully. New and heavier hammers are being installed to offer additional power and to increase Kropp's capacity. One hammer of 16,000-lb capacity went into production last December and two of 20,000 and 35,000-lb capacity are expected to be turning out titanium forgings by March.

## Special Report

*Continued*

35 pct of wire mill products for copper users.

Some fabricators and distributors already report they have plenty of aluminum in stock for defense orders and suggest they be permitted to turn the rest into civilian channels.

**Scrap Improving**—Spotty reports from various districts indi-

cate that nonferrous scrap is also beginning to loosen up. There have even been a few sales of lead scrap at reduced prices. Copper and brass scrap is flowing more freely and secondary smelters have been able to increase operations, though they are still below normal. January brass and bronze ingot output was 28,315 tons, 8000 tons better than December and the

highest since last July. Even aluminum smelters are faring better.

All this points to definite improvement of supply of nonferrous metals. It should mean more metal for non-defense consumers—if the government will relax controls. And makers of some consumer products may have eyes bigger than their stomachs.



# STEEL: Oil People to Get More

**IRON AGE survey shows demand for oil country goods at all-time high . . . Seamless mills at full capacity . . . Drill pipe very tight . . . Goal is 45,000 new wells . . . List line-pipe allocations**

A special survey by IRON AGE editors shows that demand for oil country goods is at an alltime high. All producers, especially seamless mills, are working at full capacity, with backlogs as large as feasible under the Controlled Materials Plan. If it were not necessary for consumers to have CMP tickets mills could be booked as far ahead on oil country goods as they would like to be committed.

The pressure is strong on all types of oil country goods. During the past few months drill pipe has become exceptionally critical. In addition to regular sources of supply, oil country operators are resorting to conversion and foreign steel sources to help them drill every possible well. This is one area of the steel market where premium prices are still being paid. Industry sources expect oil country goods to be among the last steel products to be decontrolled.

**High Goals** — Such unrelenting demand is readily explained by a look at the figures on drilling of new wells. A very high goal of 44,000 new wells was set for 1951. High production of pipe by steel mills and plenty of scrounging around by oil country people enabled them to beat this goal by 1000 new starts.

This was considered quite an achievement. But the industry hopes it will get sufficient backing from Petroleum Administration for Defense to start at least 45,000 or more new wells this year. To accomplish this, at least 25,000 new wells will have to be started in the second half of the year. PAD has even bigger ideas about 1953—possibly 80,000 wells.

**Expect Bigger Quotas**—Allocations of oil well casing, drill pipe and line pipe have been fluctuating somewhat, although the trend is be-

lieved to be upward. Here's the picture of allocations of line-pipe:

|                           |              |
|---------------------------|--------------|
| Third Quarter 1951 . . .  | 550,991 tons |
| Fourth Quarter 1951 . . . | 654,699 tons |
| First Quarter 1952 . . .  | 641,599 tons |
| Second Quarter 1952 . . . | 588,081 tons |

Third quarter allocations of line-pipe are expected to be substantially large.

Here's how allocations of oil well casing, drill pipe and tubing have been going:

|                           |              |
|---------------------------|--------------|
| First Quarter 1952 . . .  | 401,600 tons |
| Second Quarter 1952 . . . | 412,000 tons |

They, too, are expected to increase in third quarter.

**Conversion Hope**—Although other steel users have been dropping conversion deals like hot potatoes, this is still the brightest hope oil country operators have of obtaining additional steel.

Those arranging for oil country steel through conversion will be issued extra tickets (above their existing quota) to cover it. As an additional incentive, the conversion tonnage then becomes a basis for receiving a bigger quota in the next allotment period.

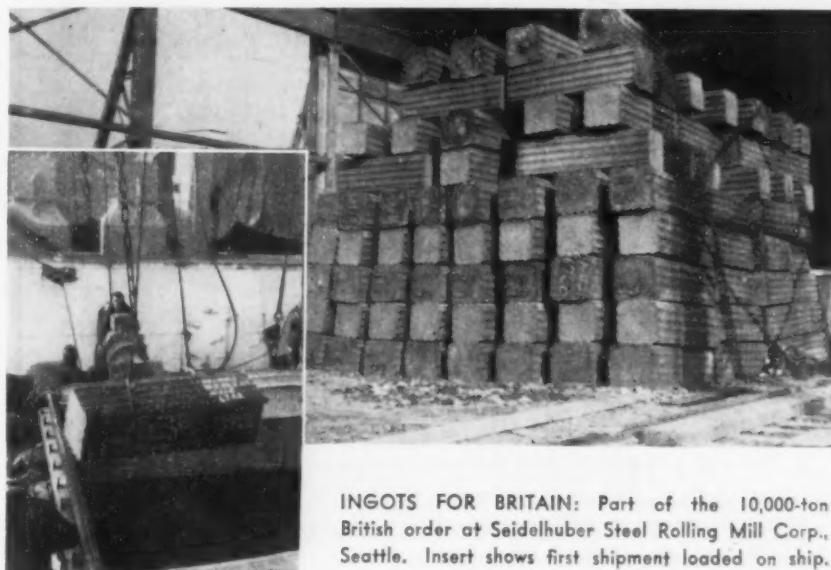
**Ingots Tight Again**—Field reports indicate oil country people are hastening to arrange conversion wherever possible. But this is costly and difficult. Ingots or other suitable semi-finished steel aren't easy to get. Several weeks ago they were, but the government deal with Great Britain changed that.

Of the 1.4 million tons of steel which will go to Britain, close to half may be in the form of ingots. This has taken ingots practically off the market.

A check of steel sources indicates it will be difficult for any oil people to step into the market and buy a substantial quantity of ingots. Even if they were able to do this, they would probably have to pay upwards of \$75 a ton.

**Hardest Part**—Yet getting ingots is hardly half the problem. It would then be necessary to arrange to have them converted into tube rounds and thence into seamless tubes. An alternate arrangement would be to have the ingots rolled into plate (or skelp) and then welded into pipe.

But either method would probably require finding open facilities in at least two steel companies. Since these types of facilities are generally being operated at capacity, such conversion arrangements will require no end of perseverance and ingenuity. Sheet conversion was a lot simpler.



INGOTS FOR BRITAIN: Part of the 10,000-ton British order at Seidelhuber Steel Rolling Mill Corp., Seattle. Insert shows first shipment loaded on ship.

## PRICES: Wholesale Index Revised

**Few wage contracts affected . . . New method greatly increases price coverage . . . Marked broadening of machinery classification... 1947-49 now used as base period—By G. G. Carr**

Fears of a round of automatic wage increases because of Bureau of Labor Statistics' revision of the Wholesale Price Index are groundless. Nearly all of the cost of living "escalator" clauses in wage contracts are based on the distinctly separate Consumers' Price Index. No revision of this latter index is planned until January, 1953.

The WPI revision, announced last week, will be of importance for many other business transactions. Forward purchasing and charges for continued supplying of goods are frequently based on this barometer.

**More Prices**—Most important change is in the number of commodities priced each month. The

revised index will cover over 1900 separate items representing transactions of \$200 billion. It was previously based on 900 commodities valued at about \$80 billion. The new index will represent all sales on the nation's primary markets, rather than only a minor part.

BLS says the greatest increases in coverage are in the machinery and textile products groups. These together will now constitute almost 25 pct of the index. Services, real estate, securities, and new, unestablished commodities will continue to be excluded.

**New Base**—Addition of so many new price series made it necessary to change the base of the index to the postwar period. The new base period of 1947-49 was chosen in

accordance with government policy of putting all indexes on the same base when possible. BLS warns against considering any year as "typical" or "normal". In any year, strikes, shortages, and other factors must be taken into account.

Besides extended coverage, the revision will cut the time needed for compiling and publishing the index. Most of the thousands of computations each month can now be done by machine. BLS hopes to have the data ready within 2 weeks after the end of the month. Further speed and economy are gained by pricing each commodity on only 1 day a month instead of once a week as before.

**Same Formula**—Since the index is so widely used in business transactions, some changes in contracts are inevitable. The unrevised index remains official through December, 1951. The revised index has been published for 1926 on the economic analysis only. No change will be made in the fundamental formula for computing the index. The modified Laspeyres formula, now used for most index-number construction, will continue to be used.:

$$I = \frac{\sum P_t Q_0}{\sum P_0 Q_0} \times 100$$

$P_t$  is the price in the current period

$P_0$  is the price in the base period

$Q_0$  is the quantity weight in the base period.

BLS says it will be glad to advise on the mechanics of contract adjustment. Experts will be available in principal cities for consultation. They will also suggest means of approximating composite indexes which have been previously published but are now discontinued in the revised index.

Meanwhile some experts charged that BLS was using an inflationary period as a base. Others have come to the bureau's defense, saying that the use of such was more or less inevitable, and that any weakness was fully compensated for by the greatly increased coverage of the revised index.

### REVISED WHOLESALE PRICE INDEX OF ALL COMMODITIES\*

(1947-49 = 100)

| Year | Jan.  | Feb.  | Mar.  | Apr.  | May   | June  | July  | Aug.  | Sept. | Oct.  | Nov.  | Dec.  | Average |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| 1926 | 67.0  | 66.3  | 65.4  | 65.2  | 65.3  | 65.3  | 64.4  | 64.4  | 64.8  | 64.6  | 64.0  | 63.6  | 65.0    |
| 1927 | 62.0  | 62.7  | 62.3  | 61.6  | 61.1  | 61.2  | 61.3  | 61.9  | 62.6  | 62.8  | 62.6  | 62.6  | 62.0    |
| 1928 | 62.6  | 62.3  | 62.1  | 62.8  | 63.4  | 62.9  | 63.3  | 63.4  | 64.1  | 62.9  | 62.3  | 62.3  | 62.9    |
| 1929 | 62.3  | 62.0  | 62.5  | 62.1  | 61.5  | 61.9  | 62.7  | 62.6  | 62.5  | 61.8  | 60.7  | 60.6  | 61.9    |
| 1930 | 60.1  | 59.4  | 58.6  | 58.5  | 57.7  | 58.4  | 54.8  | 54.8  | 54.9  | 53.9  | 52.8  | 51.7  | 56.1    |
| 1931 | 50.8  | 49.9  | 49.4  | 48.6  | 47.6  | 48.9  | 46.8  | 46.9  | 46.3  | 45.7  | 45.6  | 44.6  | 47.4    |
| 1932 | 43.8  | 43.1  | 42.9  | 42.6  | 41.9  | 41.6  | 41.9  | 42.3  | 42.5  | 41.9  | 41.5  | 40.7  | 42.1    |
| 1933 | 39.6  | 38.8  | 39.1  | 39.2  | 40.6  | 42.2  | 44.8  | 45.2  | 46.0  | 46.3  | 46.2  | 46.0  | 42.8    |
| 1934 | 46.9  | 47.8  | 47.9  | 47.7  | 47.9  | 48.5  | 48.6  | 49.7  | 50.4  | 49.7  | 49.8  | 50.0  | 48.7    |
| 1935 | 51.2  | 51.7  | 51.6  | 52.0  | 52.1  | 51.9  | 51.6  | 52.3  | 52.4  | 52.3  | 52.4  | 52.6  | 52.0    |
| 1936 | 52.4  | 52.4  | 51.7  | 51.8  | 51.1  | 51.5  | 52.3  | 53.0  | 53.0  | 53.0  | 53.6  | 54.7  | 52.5    |
| 1937 | 55.8  | 56.1  | 57.0  | 57.2  | 56.8  | 56.6  | 57.2  | 56.9  | 56.8  | 55.8  | 54.1  | 53.1  | 56.1    |
| 1938 | 52.6  | 51.9  | 51.8  | 51.1  | 50.8  | 50.9  | 51.2  | 50.7  | 50.9  | 50.5  | 50.3  | 50.1  | 51.1    |
| 1939 | 50.0  | 50.0  | 49.9  | 49.5  | 49.5  | 49.2  | 49.0  | 48.7  | 51.4  | 51.6  | 51.4  | 51.5  | 50.1    |
| 1940 | 51.6  | 51.2  | 50.9  | 51.1  | 50.9  | 50.4  | 50.5  | 50.3  | 50.7  | 51.2  | 51.7  | 52.0  | 51.1    |
| 1941 | 52.5  | 52.4  | 53.0  | 54.1  | 55.2  | 56.6  | 57.7  | 58.7  | 59.7  | 60.1  | 60.1  | 60.9  | 56.8    |
| 1942 | 62.4  | 62.8  | 63.4  | 64.1  | 64.2  | 64.1  | 64.1  | 64.4  | 64.8  | 65.0  | 65.2  | 65.6  | 64.2    |
| 1943 | 66.2  | 66.6  | 67.2  | 67.4  | 67.6  | 67.4  | 67.1  | 67.0  | 67.0  | 67.0  | 66.9  | 67.1  | 67.0    |
| 1944 | 67.1  | 67.3  | 67.5  | 67.5  | 67.6  | 67.8  | 67.7  | 67.5  | 67.6  | 67.7  | 67.8  | 68.0  | 67.6    |
| 1945 | 68.2  | 68.3  | 68.4  | 68.7  | 68.9  | 69.0  | 68.5  | 68.7  | 68.4  | 68.8  | 69.4  | 69.6  | 68.8    |
| 1946 | 69.6  | 70.0  | 70.8  | 71.6  | 72.1  | 73.3  | 81.1  | 83.9  | 80.6  | 87.2  | 90.8  | 91.6  | 78.7    |
| 1947 | 92.3  | 93.1  | 95.4  | 94.8  | 94.3  | 94.3  | 95.3  | 96.5  | 98.4  | 99.6  | 100.7 | 102.6 | 96.4    |
| 1948 | 104.5 | 102.5 | 102.5 | 103.3 | 103.8 | 104.6 | 105.5 | 108.2 | 106.1 | 105.0 | 104.7 | 104.0 | 104.4   |
| 1949 | 102.8 | 101.2 | 100.9 | 99.9  | 99.0  | 98.2  | 98.0  | 98.2  | 98.3  | 97.9  | 97.8  | 97.7  | 99.2    |
| 1950 | 97.7  | 98.3  | 98.5  | 98.5  | 99.6  | 100.2 | 103.0 | 105.2 | 107.1 | 107.7 | 109.3 | 112.1 | 103.1   |
| 1951 | 115.0 | 116.5 | 116.5 | 116.3 | 115.9 | 115.1 | 114.2 | 113.7 | 113.4 | 113.7 | 113.6 | ..... | .....   |

\* This does not replace the former index (1926=100) as the official index of primary market prices prior to January 1952.

Source: Bureau of Labor Statistics.

# SCRAP: Shortage-Hit Supply Stirs

Supply moves more freely, stockpiles gain . . . Hard winter battle has been won . . . Spring thaw near . . . Allocations will slip . . . Cast sluggish . . . Stricter inspections—By T. Metaxas.

Bated breath of the steel mill scrap iron and steel purchasing agent is relaxing into a long sigh of relief. The bitter scrap battles of January and February have been fought and won—and now the spring scrap thaw is just around the bend. Shortage casualties in the openhearth line-up have been insignificant.

March's early display of temper did not dislodge any of the complacency for it is believed that winter can have no serious scrap-crippling effects at this late stage.

In this period of a sustained scrap shortage any favorable break is regarded as a cue to send up a cheer. The first wriggings of today's freer supply have turned the dark clouds inside out to reveal the silver lining.

Roots of this psychology of relief are in the dark days of January when mills operated on a few hours to a few days supply. The national scrap inventory average has picked up to about 15 days.

**Inventory Gains** — Stockpiles still maintain their puny status when matched against the scrap metal mountains of yesteryear. But the main thing considered today is that scrap flow has moved off the congested street and inventory is gaining. There is a slow-up in the tempo and urgency of National Production Authority allocations of scrap. A month ago this shuffling and reshuffling of scrap to balance overall supply among famine-struck districts was the mainstay of steel production. Some allocations are refused.

Good grades of heavy melting openhearth scrap are still tight. And by old standards stockpiles are still feeble. (See p. 314.)

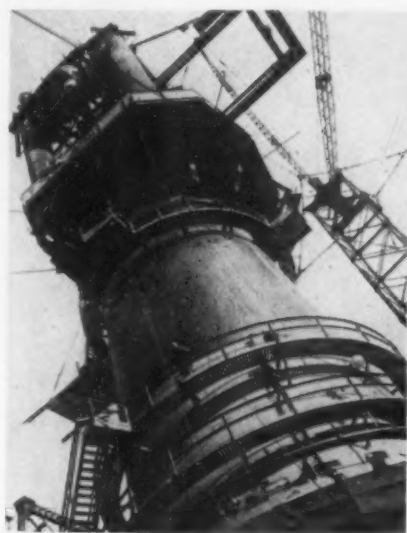
**Junk Cars**—NPA's stimulation of the junk auto source of scrap has been a spearhead in beating

the shortage this winter. Demands that auto graveyard operators turn over their inventory in 90 days, while extended now for another 30 days because of non-compliance, has brought in large tonnages of surplus scrap. NPA estimated that graveyards hold 4 million eligible wrecks.

Autowreckers have been irritated by loss of a crucial source of income. Their unstripped motor blocks are backing up into their yards. Demand for that grade of cast is the rotten spot in an already lifeless cast scrap market.

Because foundries found the economic footing too slippery amidst civilian cutbacks with no compensating defense orders, they have entered a period of hard knocks. Cast grade demand became paralyzed and dealers' yards have been glutted with this material. So phlegmatic is movement of cast that in many cases it is difficult to pinpoint realistic prices.

THE IRON AGE has confirmed that cast grades in many sectors have sold below ceiling prices.



ALMOST READY: Republic Steel Corp. plans to blow in its new No. 6 blast furnace this month in Cleveland. More hot metal can help ward off scrap shortages.

**Gentle Touch**—Except for a few sneak assaults on scrap centers, winter has had a gentle touch this year. It has helped scrap men thrust their collection campaigns deep into the cold months when normally scrap was left to sleep. Consequently the spring thaw of scrap will not yield a full harvest of "frozen" scrap from customary sources. They have been tapped all winter long. Southern and New England scrap surplus areas will be hit hard to compensate.

The industry-wide scrap drive for dormant heavy scrap has gained impetus, especially from the big companies. For a time, Washington and steel industry leaders were dismayed at the poor showing plants were making in the campaign. The yield is expected to increase and the industry drive will play a major part in supplying the additional metallics to maintain 1952's expanding steel capacity.

Pig iron capacity has to some extent rescued the failing scrap supply. Ratio of scrap to hot metal has been tipped more heavily in favor of the pig iron. Now, the ratio may tend to swing back to normal—but only if it is economical for the steel producer. That is why some scrap buyers are now grumbling that the price of scrap has been pegged too high.

**Stricter Inspection**—Small as it may be, dissatisfaction over OPS prices is a positive symptom of the easier feeling. Another is the fact that scrap inspectors have donned their glasses to put a new emphasis on scrap quality. OPS inspectors, raiding Detroit and Pittsburgh, have also added to inspection strictness.

As warmer weather aids scrap, steel plants will seek to avoid purchase of more remote scrap to avoid higher freight rates through allocations. NPA's allocations empire will lose much authority as purchasing agents return to deals within their former bailiwicks. Efforts to shorten freight runs of scrap cars will be much strengthened by warmer weather.



## STEEL: You May Try for 10 Pct Bonus

**Manufacturers can apply for 10 pct bonus on first quarter sheet, strip, blackplate quotas . . . Market softness plus consumer prodding trigger NPA action—By A. K. Rannells.**

In a frank attempt to feel out the extent of softening of some types of steel supply, National Production Authority last week declared a special dividend in allocations of three types—but with reservations.

Both producers and consumers of steel, feeling that NPA had cut into civilian production too deeply and too soon, have been hammering away at the agency to relax some controls. They have insisted this could be done without slowing the cutback defense program one iota.

Manufacturers of specified end-items of civilian hard goods may apply for supplemental allotments of up to 10 pct of their first quarter allocations of hot- and cold-rolled sheet and strip and tin mill blackplate.

About 250,000 tons will be thus distributed. Henry H. Fowler, NPA head man, warns that this action is experimental, and is not

to be regarded as setting a precedent. But it is significant that the listing of items for which extra steel will be granted is an open-end list.

**May Get More Aluminum—**Although they will not comment officially, top control officials also are watching aluminum production closely. They would not be surprised to find the supply of aluminum sheet and strip suddenly following the steel pattern—although current requirements are still 40 to 50 pct more than the supply.

One reason is that the previously-estimated big backlog of aluminum requirements now begins to look as if it were a "paper" carry-over. Defense Production Administration is coming around to a more realistic view, and it is believed that some soft spots may develop in aluminum.

While this indicates that there

will be larger allotments for civilian goods by beginning of the third quarter, officials first want to make sure that essential demands can be met without withdrawing any more metals from the stockpile. They are still not optimistic about copper supplies.

One of the conditions for extra steel allotment is that the manufacturer must be able to use it without more aluminum and copper than was originally allotted.

Prospects for extra steel, as previously reported by THE IRON AGE, have already brought "quite a large number" of applications from civilian manufacturers who believed they could meet the conditions, Mr. Fowler says. These are now being processed.

**Not Charged—**Since the official decision was made in late February and perhaps too late to get on mill books for first quarter delivery, Mr. Fowler states, the supplemental allotments can be carried over for second quarter delivery. They will not be charged to the regular second quarter allocations.

Currently, the extra allotments are restricted to the manufacture of about 110 end products in the industrial-commercial equipment, farm equipment, building materials, consumer durables, and packaging materials categories. Typical of the 110 items are:

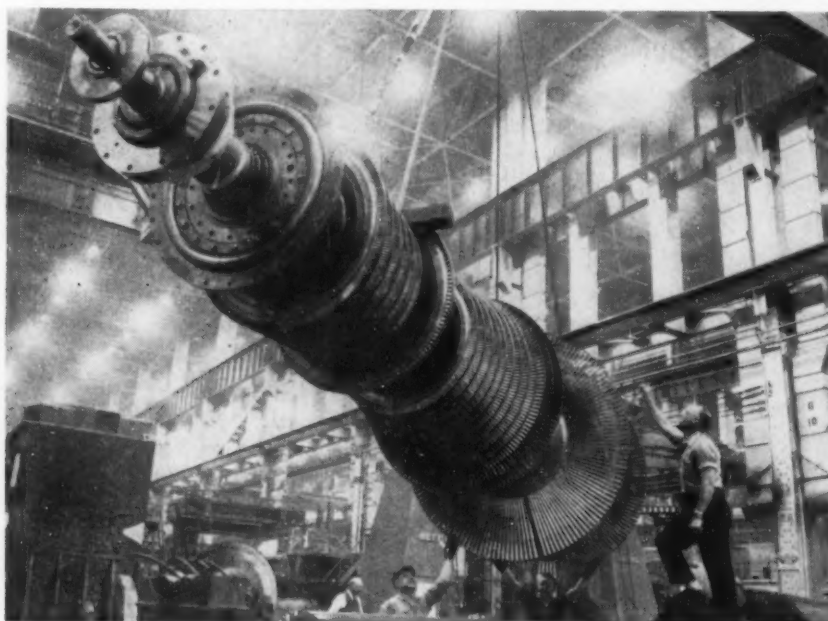
Industrial-commercial equipment—shop and factory metal furniture, industrial fans and blowers, metal tote boxes, metal desks and hospital beds.

Farm equipment—farm silos, metal feeders, wheel-type tractors, metal posts and fencing.

Building materials—builders' hardware, warm air furnaces, metal doors, metal lath, screening, street and highway guard rails.

Consumer durables—metal furniture, shelving and lockers, home and farm freezers, pails and cans, and cabinets.

Packaging materials—steel strapping, reels, spools, and cans and containers made from uncoated sheet.



**POWER MAKER:** Annual production of steam turbine-generators by General Electric Co. last year hit the 4 million kw combined capacity level. Here a 42,200-lb rotor for a 50,000-kw generator is lifted at GE's Schenectady plant.

## IRON: France Modernizes Its Mines

**War-caused obsolescence, reduced labor force crucial reasons for intense mechanization . . . Automatic loading jumps 58 pct . . . Much American equipment bought with ECA funds.**

French iron ore mining emerged from World War II almost unscathed—but found itself 10 years behind the times. From that time until now the industry has been aiming at greatly increased productivity. And with the help of French determination and American and French machinery it has met its goals.

One vital reason behind mechanization was the increasing shortage of skilled labor. In 1929 the industry had 40,000 miners but business conditions and desertions reduced this force to 25,500 today. Beating this deficit has led to much greater productivity per worker through more machines.

For example, automatic loading has jumped from 10 pct mechanization during the war to 45 pct by 1949, with plans of an increase to 68 pct this year. After French mining experts had come to America to carry away with them our technical secrets, a great deal of American machinery was imported and put to quick use—especially in mines of the Lorraine district, where the wealth of French iron ore is located.

**U. S. A. Label**—Much of the new equipment had a U. S. A. label on it. But French producers would like it understood that it has not been an outright gift to them. True the machines were purchased by French government ECA funds. But the mine reimburses the French government in full. The mine owners got not a shovel free.

A Joy 18 HR 2 automatic loader found a home in Lorraine ore fields, performing admirably after some modifications for hardness of French ore. Fifteen of these are now in service and another five are ready for service. In just

over 2 years the Lorraine mines have increased their automatic loaders from 245 to 385, including some French machines. Productivity per man is on a skyward ride.

### Steel Mill for So. Africa:

**Would be in production by 1953 using Krupp-Renn Reduction Process.**

The second stage in the development of an integrated iron and steel works in the Union of South Africa has been reached by The Dominion Iron & Steel Corp., Ltd., of Johannesburg. An attempt is being made to accumulate sufficient additional capital to begin construction with actual production scheduled for late 1953. Formed in 1950, the corporation will erect an iron works using the Krupp-Renn Process and a steel mill.

Preliminary stages of acquiring rights to the Krupp-Renn Process, factory site, and raw material options have already been carried out. Upon completion it is anticipated that the works will have an annual iron output of 70,000 tons which will be converted to a steel output of 48,000 tons yearly. Proximity

of the works to raw material supplies and transportation would give operations an economic advantage.

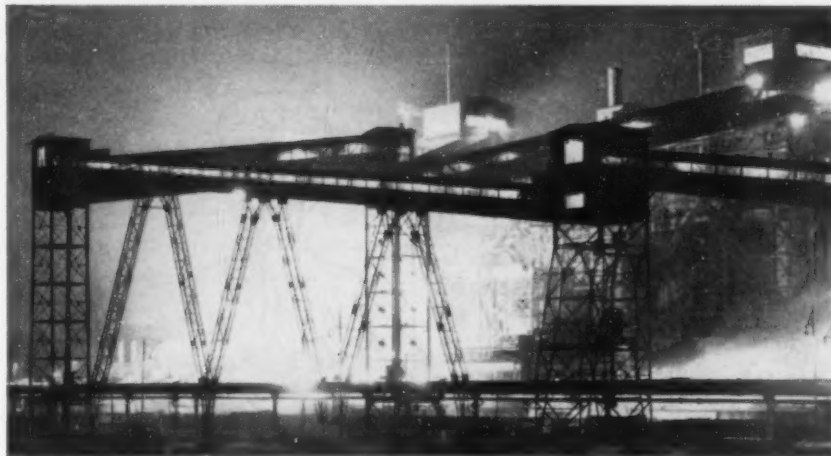
The Krupp-Renn Process was chosen for its economy in treating medium and low-grade ores and in elimination of high-grade coking coal as fuel. The process was developed in Germany about 15 years ago. Plants have been erected in many other European countries as well as in Japan, Korea and Manchukuo.

Krupp-Renn plants reduce ores in cylindrical rotary kilns and in this instance will use "duff" coal as fuel. High ash contents are not objectionable in this process whereas blast furnace operation requires a high grade of metallurgical coke.

Original plans called for the installation of two reduction kilns. Due to an increasing demand for steel production in the Union of South Africa, technical advisers recommended integration of the steel works. Provision is being made to add future kilns and steel mills without difficulty.

### Dutch Push Industrialization

The Netherlands Government is now giving manufactured exports priority over agricultural products. This reversal of prewar policy is part of a drive to further industrialize the country. Plans call for an increase in steel production from the present 500,000 metric tons to about 800,000 by 1952-53.



**NIGHT WORK:** Steel mills in Germany's Ruhr work around the clock producing thousands of tons of steel daily for the Atlantic Pact powers. Ruhr cities are the chief contributors of steel to West European defense.



## STRUCTURALS: Enough for Expansion

**All industrial and commercial projects now underway can be completed . . . Industry will get 267,775 tons, others to receive 17,197 . . . Defense Dept. gets most among claimants.**

Sufficient structural steel has now been earmarked by National Production Authority to assure completion of all industrial and commercial expansion programs now underway.

Out of the supply in sight, a total of nearly 285,000 tons will be tagged for this purpose. Industrial programs are to get 267,775 tons, and 17,197 tons will be allocated for finishing commercial type projects. These include stores, hospitals, churches, etc.

The total figure includes 70,000 tons, which will be available as a result of reshuffling original allocations and adding additional amounts made available through the stretch-out of the military program.

**Allotments** — "Beginning with second quarter, we will allot sufficient structural steel for delivery in that and succeeding quarters to take care of all these projects now started," NPA says.

Steel expansion projects will have 98,793 tons earmarked for them. These include ferroalloy and foundry programs.

Other major allotments include 43,718 tons for completion of aircraft, shipbuilding and ordnance facilities; 41,902 tons for aluminum, magnesium and light metals plants; and for machine tool and general industrial equipment facilities, 12,078 tons.

**Claimant Agencies**—At the same time, Defense Production Administration released second-quarter allocations of structural steel to the various claimant agencies.

Lion's share — 220,628 tons — goes to the Defense Dept. Other major claimant agencies get allotments as follows:

Defense Electric Power Administration, 148,500 tons; Defense

Transport Administration, 24,255; Bureau of Public Roads, 70,600; Petroleum Administration for Defense, 51,480; and Atomic Energy Commission, 20,642 tons.

Major allotments to NPA's industry divisions included 135,529 tons to the Railroad Equipment Div.; Canadian Div., 55,152; General Industrial Equipment, 62,438; Metalworking Machinery & Equipment, 35,046; and Construction Machinery Div., 32,800 tons.

### Check Metals Price Compliance

Government investigators believe they will catch a lot of non-compliers in their net while dragging the metals industry to find who isn't abiding by pricing regulations.

Office of Price Stabilization enforcement director Edward P. Morgan got the operation started by ordering "immediate investigation" of 1500 complaints forwarded from Washington to OPS field offices. Morgan charged "widespread lack of compliance," with notable lack of adherence to regulations in the scrap metals field and in the resellers' field, "especially in steel."

This industry check is no temporary effort, the OPS official said. It has high priority and is de-

scribed as a "sustained phase of the enforcement program."

Study will not be confined to those complaints sent out from Washington. District enforcement officers may open cases in their areas "wherever investigations are warranted."

Compliance or non-compliance with Ceiling Price Regulations 5, 46, 47, 53, 54, and 98 will be covered, according to Morgan. These concern iron and steel scrap, resold iron and steel products, and nonferrous metals.

### Industry Controls This Week

**Batteries**—M-93 revoked.

**Brass Ingots**—CPR 127 sets dollar-and-cents prices.

**Coal**—Anthracite coal and briquet producers may add charges for special services to ceiling prices under Amend. 3, CPR 4.

**Coke**—Amend. 7, SR 13, GCPR extends expiration of this order to May 31, 1952.

**Cryolite**—Placed under full allocation control by M-99.

**Government Property** — Certain items, mainly surplus, are indefinitely exempted from price control by Amend. 2, SR 72, GCPR.

**Lead**—Use restrictions of M-38 lifted. Inventory ceilings increased from 30 to 60 days.

**Merchant Wire Products**—Jobbers' prices for these and some other steel prices raised by Amend. 1, CPR 98.

**Ships**—Amend. 15, GOR 9, continues exemption from price controls for ships until May 13.

**Tires**—Manufacturers of tires and some other rubber goods are granted optional methods of applying for Capehart increases by Amend. 4 SR 10, CPR 22.

### March Copper Allocations Issued

March allocations of copper raw materials will run about the same as for February, but will be about 9000 tons under the last-half 1951 monthly average.

March refined copper allocations will be as follows: Brass mill products, 46,338 tons; wire mill products, 50,602 tons; foundry products and others, 6000 tons; and export, 3560 tons.

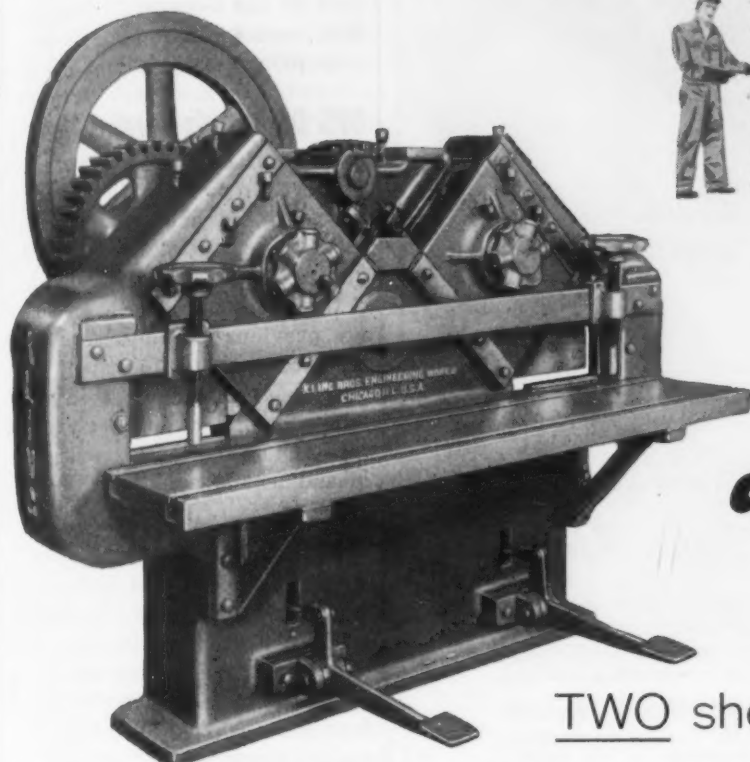
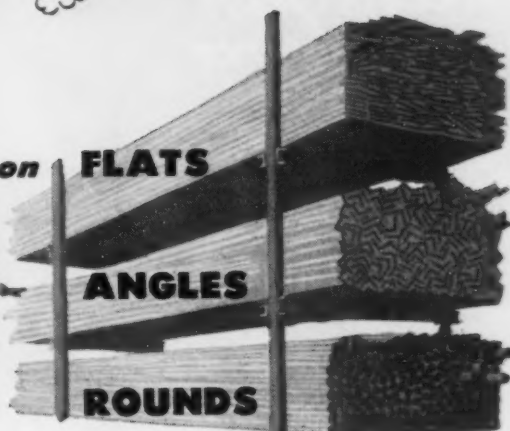


"That young upstart annoys me. He keeps having the facts to back up his arguments."



# It's the **BUSIEST** machine in the shop!

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## **Kling** double angle shears

TWO shears in ONE machine!

If you're using obsolete, slow-poke methods of shearing, the Kling Double Angle Shear can help you save time and money. This modern compact machine is designed for high speed, high production shearing on both long and short run jobs. Many metal fabricating plants and steel warehouses have found the Kling Shear to be the workhorse of the shop. For instance, one machine will shear round bars and bar angles on the left side while the right side can be used for structural angles and flat bars. The machine is built with the speed and power to handle the bulk of your shearing requirements. For shops with considerable mitre shearing

work, Kling Double Angle Shears can be mounted on a turntable to facilitate handling. Automatic hold downs and one-shot lubrication can be furnished when desired. Sizes to handle angles up to 8" x 8" x 1 1/2".

### WANT TO CUT SHEARING COSTS?

Find out how this high-production machine can give you more cuts, cleaner cuts on your shearing operations. Write for more information and latest bulletin. Kling Bros. Engineering Works, 1322 North Kostner Avenue, Chicago 51, Illinois.

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60th  
Year

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Combination Shear  
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Punches



Plate Bending Rolls

March 6, 1952

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**A** ALWAYS  
MAKES  
POSSIBLE  
**B** BETTER  
PRODUCTS  
**C** AT LOWER  
COST



# Michigan Electric Resistance WELDED STEEL TUBING

A  
Quality  
Product

## ROUND

3/8" to 4" O. D. 9 to 22 gauge

## SQUARE-RECTANGULAR

1/2" to 2" 20 gauge, 1" to 2 3/4",  
14, 16, 18 gauge

Carbon 1010 to 1025

### Michigan Tubing

has uniform strength, weight, ductility, I. D. and O. D., wall thickness, machinability, and weldability. It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted, and rolled. Available in a wide range of sizes, shapes and wall thicknesses, prefabricated by Michigan or formed and machined in your own plant.

Plus Fabricating of our own tubing Michigan is interested **ONLY IN THE FABRICATION OF** Stainless steel, copper, brass and aluminum tubing.

## Washing Machine Center Tube Shaft

The meticulous workmanship that goes into every piece of Michigan tubing is well illustrated by the center tube shaft manufactured by Michigan for a washing machine.

In the production of this part, absolutely accurate finishing to the closest tolerances is required. For example: at the head—**I. D. plus or minus .001, O. D. plus or minus .003.** Tube O. D. is 2.50 inches, with .120 gauge thickness. Michigan's know-how and modern precision and production equipment makes it a simple matter to conform to close tolerances and ship parts ready for assembly by the customer.

We invite manufacturers to consider the advantages in cost savings and product improvement by the use of Michigan tubing.



Consult us for engineering and technical help in the selection of tubing best suited to your needs.

**Michigan** **STEEL TUBE PRODUCTS CO.**  
THE OLDEST NAME IN ELECTRIC RESISTANCE WELDED STEEL TUBING

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## Controls

### CPR 127 Sets Brass Ingot Prices

Price-control officials say the new dollars-and-cents regulation for domestic brass and bronze ingot has established ceilings in line with the pre-March level of prices charged by firms producing about 80 pct of all ingots manufactured.

The order (Ceiling Price Reg. 127, effective Mar. 3) means top prices are below ceilings authorized by the General Ceiling Price Reg. because of industry's voluntary price cuts late last summer.

### OPS Decontrols Surplus Items

Sales of certain government property, principally surplus items, are indefinitely exempted from price control by a new Office of Price Stabilization action.

OPS authorized the extension of its previous exemption of these materials, about 75 pct of them defense-agency surplus items, in Amendment 2, Supplementary Reg. 72, General Ceiling Price Reg. The amendment was effective Feb. 29.

### Lead Restrictions Lifted

Use restrictions on lead as contained in National Production Authority order M-38 have been lifted, effective at once, and inventory ceilings have been increased from 30 to 60 days. Reporting provisions are retained.

Supplies for the next few months appear sufficient to meet both defense and civilian requirements, NPA estimated.

Easing of the shortage is due primarily to growing imports, the agency said. Lead may be imported freely and inventory restrictions do not apply to imports except that domestic purchases may not be made so long as the overall stocks exceed the inventory ceiling.

### Coal Producers May Add Services

Anthracite coal and briquet producers may receive, under certain circumstances, the right to add charges for special services to their ceiling prices under Amendment 3 to Ceiling Price Reg. 4, effective Mar. 3.

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### See Can Quota Boost

National Production Authority's M-25 (metal cans) is due for swift revision to prevent secondary tin mill products from piling up in tin-mill inventories.

Under the action, NPA would amend the order so as to remove present restrictions on use of tin mill secondary plate consisting of accumulations, waste waste, unmended menders, and unassorted tempers.

This would permit users of cans or parts of cans made of these materials to use them in addition to regular quotas as now established in the order.

As a result, can manufacturers are to expect second-quarter secondary tin mill plate allocations amounting to about 68,000 tons—consisting of 40,000 tons of mill accumulation plate and 28,000 tons of waste waste, unmended menders, and unassorted tempers.

### OPS Runs Survey on Price Order

U. S. price-setting officials are going to conduct an industry sampling survey before putting in final form a regulation designed specifically to cover the coke, coal chemicals, and coke oven gas industry.

Pricers expect to determine, as one result of the survey, whether to continue in the forthcoming order the operating-margin type of control provided in Supplementary Reg. 13, General Ceiling Price Reg. SR 13 now governs pricing by the industry.

### Ships Still Off Price Controls

Sales, repair, and conversion of ships more than 65 ft long will continue to be outside of government pricers' jurisdiction until May 13, Office of Price Stabilization says.

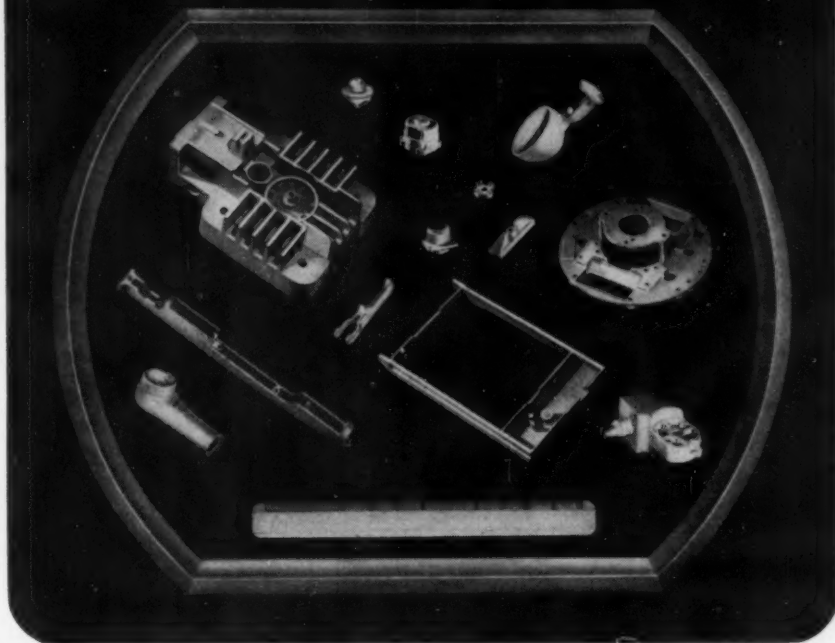
Previously, OPS had suspended these activities from price control to gain time for development of a regulation specifically written to meet industry problems. The agency has discovered, however, it will need more time to draft the order.

Extension of the suspension period is authorized by Amendment 15, General Overriding Reg. 9.

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Write for Brochure containing valuable die casting information including recommended alloys and their properties.

## The ANSTICE COMPANY, Inc.

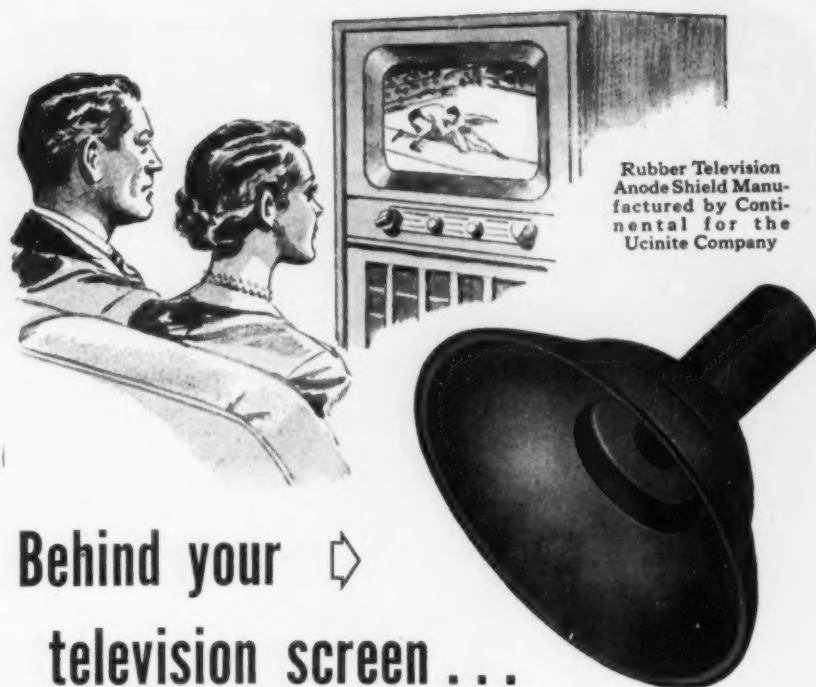
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March 6, 1952





Behind your   
television screen . . .

## Continental Rubber gets into the act

In the unseen act behind your television screen, a small cup-shaped rubber shield plays an important role. This shield fits over the anode on the side of the tube. Its function is to "seal in" high voltage current and thus prevent surface discharges that cause picture distortion.

Ordinary rubber compounds, of course, can't fill the bill. This rubber part must have exceptional dielectric properties and unusual stability under sustained heat. It must resist the deteriorating effects of ozone created by electrical discharges. In addition, the rubber shield must be precision molded to insure proper seating against the side of the television tube.

Continental engineers, working closely with Ucinite Company engineers, have met these exacting requirements. This technical cooperation typifies the service in rubber offered by Continental.

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# CONTINENTAL

## RUBBER WORKS

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### BRANCHES

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Boston, Mass.  
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Chicago, Ill.  
Cincinnati, Ohio

Cleveland, Ohio  
Dayton, Ohio  
Detroit, Mich.  
Hartford, Conn.  
Indianapolis, Ind.

Kansas City, Mo.  
Los Angeles, Calif.  
Memphis, Tenn.  
New York, N. Y.  
Philadelphia, Pa.

Pittsburgh, Pa.  
Rochester, N. Y.  
St. Louis, Mo.  
San Francisco, Calif.  
Syracuse, N. Y.

## Labor

### WSB Issues Pension Plan Rules

Millions of workers are affected by a new Wage Stabilization Board decision which exempted employee pension and profit-sharing plans from pay ceilings.

The decision has no bearing on those plans in effect before the wage-price freeze of Jan. 25, 1951. WSB is expected to take quick action, however, on an estimated 500 plans awaiting the board's approval.

No limit was set on the amount employers may contribute to approved pension and profit-sharing programs. Instead, WSB established a list of "minimum standards" to regulate benefits.

**Requirements**—The board ruled that 30 days after WSB acknowledges receipt of an employer's pension plan, that plan may be put into effect if it:

1. Provides a "normal" retirement age of not less than 65, and for a scaling down of benefits where early retirement is allowed, unless payment is deferred until the beneficiary reaches 65.
2. Spreads payments "at least over the lifetime of the employee" except where death benefits are involved.
3. Defers until the retirement age payment of any vested interest to an employee who retires early.

### WSB Amends Profit-Sharing Rules

Businessmen will meet less delay in putting into effect profit-sharing plans of the deferred-payment type for their employees because of the recent amendment to Section 3, General Wage Reg. 21.

Wage Stabilization Board says the change does two things:

1. It removes a requirement, affecting age 65 and disability retirement, of 10 years participation in the plan, but retains the stipulation that payments must be made over at least a 10-year period.
2. For severance benefits, it retains the requirement that payments cannot begin until at least 10 years after an employee's admission to the plan and must be made over at least a 10-year span.

## Defense Contracts

### Offers Expediting Service

In initiating a new service to expedite defense production, the New York State Department of Commerce learned that 250 New York metalworking firms will have at least 700,000 open hours available on 30 types of critical precision machine tools during the second quarter of 1952. Letters to more than 800 prime contractors in the northeastern quarter of the nation were sent inviting them to place contracts with such firms. Another 270 firms will have open time on production tools generally.

Despite tremendous amounts of defense production in New York State factories, some plants still have equipment available for additional work. The State Department of Commerce has announced that it will continue this service on a quarterly basis during the current defense production program.

The Department has compiled a listing of all firms reporting, tabulating type of tools and open time available as reported by 550 of the 2700 companies queried. On request prime contractors will be provided with lists of firms having open time on machine tools specified by the prime contractor.

### Kimball Asks More Subcontracting

Broader participation in the defense program by subcontractors, according to Navy Secretary Dan A. Kimball, will provide a practical solution to small business problems.

The Navy's civilian chief has called on all major contractors providing items for the seagoing forces to subcontract "to the maximum extent possible."

**How to Do It**—Practical measures called for by Mr. Kimball are the re-examination, by each prime contractor, of defense contract commitments; segregation of each component that warrants consideration for subcontracting; and compilation of sufficient job data to enable Navy material inspectors and small business specialists to suggest subcontractors.

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**STEELS**

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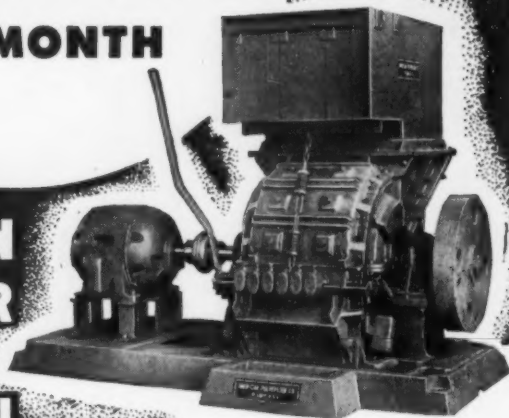
Plant: New Castle, Indiana



March 6, 1952

**IF  
YOUR  
METAL TURNINGS  
AMOUNT TO  
10 TONS OR MORE  
PER MONTH**

**AN AMERICAN  
METAL  
TURNINGS CRUSHER  
can bring you  
NEW PROFITS!**



AMERICAN #2400  
METAL TURNINGS CRUSHER

A chip salvage system, with an American Metal Turnings Crusher at the core, can help you realize new savings and profits in metal, oil, man-hours, factory space, and tool maintenance. Consider these typical money-saving, money-making advantages of an American installation:

- (1) Brings \$3 to \$4 more per ton for chips than for long machine shop turnings,
- (2) Reclaims 30 to 50 gallons of cutting oil per ton,
- (3) Prolongs tool life through more liberal use of recovered oil,
- (4) Saves 75% storage space . . . permits heavier freight car loads . . . cuts shipping costs,
- (5) Easier, faster handling,
- (6) Easier briquetting, so essential for foundry and steel mill use.

**THIS COULD BE YOUR PROFIT STORY FOR NEXT YEAR!**

240 Tons Metal Turnings Per Year . . . . . \$ 960.00 Per Year  
(20 tons per month at \$4 extra per ton)

3600 Gallons Cutting Oil Recovery at 30¢ Per Gallon . . \$1,080.00 Per Year  
(30 gallons per ton x 240 tons = 7200 gallons.  
Half of this, 3600 gallons, can be credited to use  
of chips instead of long turnings.)

Estimated Savings on Manpower, Storage, Tool Maintenance, Freight, etc. . . . . \$ 300.00 Per Year

**TOTAL GROSS PROFIT**  
(Resulting from an American Installation) . . . . \$2,340.00 Per Year

**American** WRITE for American Rolling Ring Metal Turnings Crusher Bulletin.  
**PULVERIZER COMPANY**  
Originators and Manufacturers of  
Ring Crushers and Pulverizers  
1439 MACKLIND AVE.  
ST. LOUIS 10, MO.

**Defense Contracts**

**Government Inviting Bids**

Latest proposed Federal procurements, listed by item, quantity, invitation No. or proposal, and opening date. (Invitations for Bid numbers are followed by "B," requests for proposals or quotations by "Q.")

**District Corps of Engineers, San Francisco**  
Box switch stl, 3700 ea., 04-203-52-798, Mar. 10.  
Fixture lgts, 1500 ea., 04-203-52-798, Mar. 10.  
Guard lamp port, 2000 ea., 04-203-52-798, Mar. 10.

**Frankford Arsenal, Philadelphia**  
Spare parts for director M9 and M10, var 40 items, Ord-52-471, Mar. 17.  
Spare parts instrument lights & aiming, var, Ord-52-473, Mar. 17.  
Rotating band-blank for 20MM projectiles, var 4 items, Ord-52-474, Mar. 5.  
Spare parts for telescope elbow M16A1, 3000 ea., Ord-52-491, Mar. 17.  
Spare parts adapter tel range quadrant, var 10 items, Ord-52-493, Mar. 17.  
Spare parts for remote control system M 18, var 4 items, Ord-52-493, Mar. 17.  
Spare parts for watches, 1000 ea., Ord-52-494, Mar. 18.  
Spare parts for mt telescope, var 2 items, Ord-52-496, Mar. 18.  
Spare parts for remote control system M6A1M12, 1000 ea., Ord-52-497, Mar. 18.  
Fuse setter M27, var 2 items, Ord-52-501, Mar. 11.  
Spare parts for sight computing M7A1, var 17 items, Ord-52-540, Mar. 21.  
Spare parts for range finder M10, var 6 items, Ord-52-506, Mar. 12.  
Maint parts for sight unit M34, 300 ea., Ord-52-507, Mar. 19.  
Spare parts for periscope, var 18 items, Ord-52-530, Mar. 20.  
Spare parts for director M9, var 3 items, Ord-52-544, Mar. 24.  
Spare parts for director M9 & M10, var 15 items, Ord-52-500, Mar. 18.  
Lathes, turret, saddle type, var 2 items, Ord-52-560, Mar. 13.  
Spare parts for sight computing M7A stands, var 2 ea., Ord-52-564, Mar. 25.

**Navy Purchasing Office, Washington**  
Vises chain repair adjustable machinists, 2235, 5949B, Mar. 11.  
Taps hand carbon, 98000, 5945B, Mar. 12.  
Primer, cup, anvil drawing, 2480000, 5936-B, Apr. 2.  
Anvils, blacksmiths, 1560, 3370Q, Mar. 17.  
Vibrator, aircraft engine starting, 1810, 5937A-B, Mar. 18.  
Bars, crow, wrecking, 3058, 5944B, Mar. 11.  
Taps, hand, carbon steel, 117800, 5946B, Mar. 17.  
Cutters, milling, 6264, 5948B, Mar. 17.  
Lathe, milling, attachments, 82, 5950B, Mar. 17.

**Naval Supply Depot, Mechanicsburgh, Pa.**  
Washers, flat, lock, various types, 611550 ea., 72-21862, Mar. 19.

**Rock Island Arsenal, Rock Island, Ill.**  
Ratchet assy, 500 ea., 11-070-52-607B, Mar. 14.  
41 items of reamers, 12265 ea., 11-070-52-710B, Mar. 20.  
6 items of saws circular, 2885 ea., 11-070-52-710B, Mar. 20.

**Ordnance Tank Automotive Center, Detroit**  
Wrench adj, 5100, 52-1400B, Mar. 21.  
Wrench spanner, 1675, 52-1400B, Mar. 21.  
Kit, repair, propeller shaft, 5200, 52-1802B, Mar. 29.  
Bearing set, 1800, 52-1490B, Mar. 20.  
Spring, frt assy, 18000, 52-1345B, Mar. 20.  
Roller trans main shaft, 1175000, 52-1438B, Mar. 10.  
Screw mach, 830,000, 52-1892B, Mar. 18.  
Compressor air, 300, 52-1814B, Mar. 21.  
Bearings bushing type shackle brkt, 10000, 52-1817B, Mar. 31.  
Pin, frt, spring, shackle, 1000, 52-1813B, Mar. 20.  
Stud ball frt axle, 20000, 52-1763B, Mar. 25.  
Pin, pintle latch roller, 50000, 52-1402B, Mar. 21.

**Detroit Arsenal, Center Line, Mich.**  
Cover turret, 1825 ea., 52-222B, Mar. 17.



## This Week in Washington

### More Steel and Fewer Controls?

**Extra steel for civilian goods believed to herald further relaxation of controls . . . Congress demands explanation of more aid to wealthy foreign countries — By G. H. Baker.**

Government planners are reluctantly corroborating industry reports of softening steel markets.

Last week's announcement by National Production Authority that many manufacturers of civilian goods would receive about 10 pct more steel in the current calendar quarter is believed by insiders to be the tip-off for further relaxations of metals controls. (See p. 168.)

Here's what the latest formal relaxation amounts to: Manufacturers of such products as refrigerators, metal furniture, home freezers, stoves, and electrical equipment now may form a queue for about 250,000 tons of surplus steel.

The 10 pct. "bonus" is in addition to regular allotments already delineated by NPA.

There's a catch to the new bonus offering, however. Applicants for the extra ration must prove to NPA's satisfaction that they will not also require extra rations of copper or aluminum as a result of the bigger steel allotment.

**Why?**—Angry congressmen are demanding explanations from the State Dept. as to why financial aid still is being extended to countries in sound financial condition.

State Dept. replies to date ("We're building good will") are not considered satisfactory by many members of both political parties.

Indonesia, for example, has thus far received about \$10 million in military and economic assistance from the United States. Informed sources report that the Indonesian Government neither needs nor is

very anxious to receive U. S. handouts.

Actually, Indonesia is one of the wealthiest nations in the Far East. It is rich in rubber, tin, and oil, and is rapidly expanding and improving its development of these resources. As a nation, it has gold and dollar reserves of more than \$400,000,000. In 1951, it had a trade surplus of \$89 million.

**Tax Limit**—The proposed constitutional amendment which would limit the federal tax take to 25 pct of each income is building up widespread concern among "big budget" congressmen.

Staff economists of two committees (Senate - House Economic Committee and House Small Business Committee) reported last week with considerable alarm that

adoption of the proposed amendment would spell out higher deficits, inflation, and enactment of a federal sales tax.

The idea that federal spending might be trimmed to match revenues was dismissed as impractical.

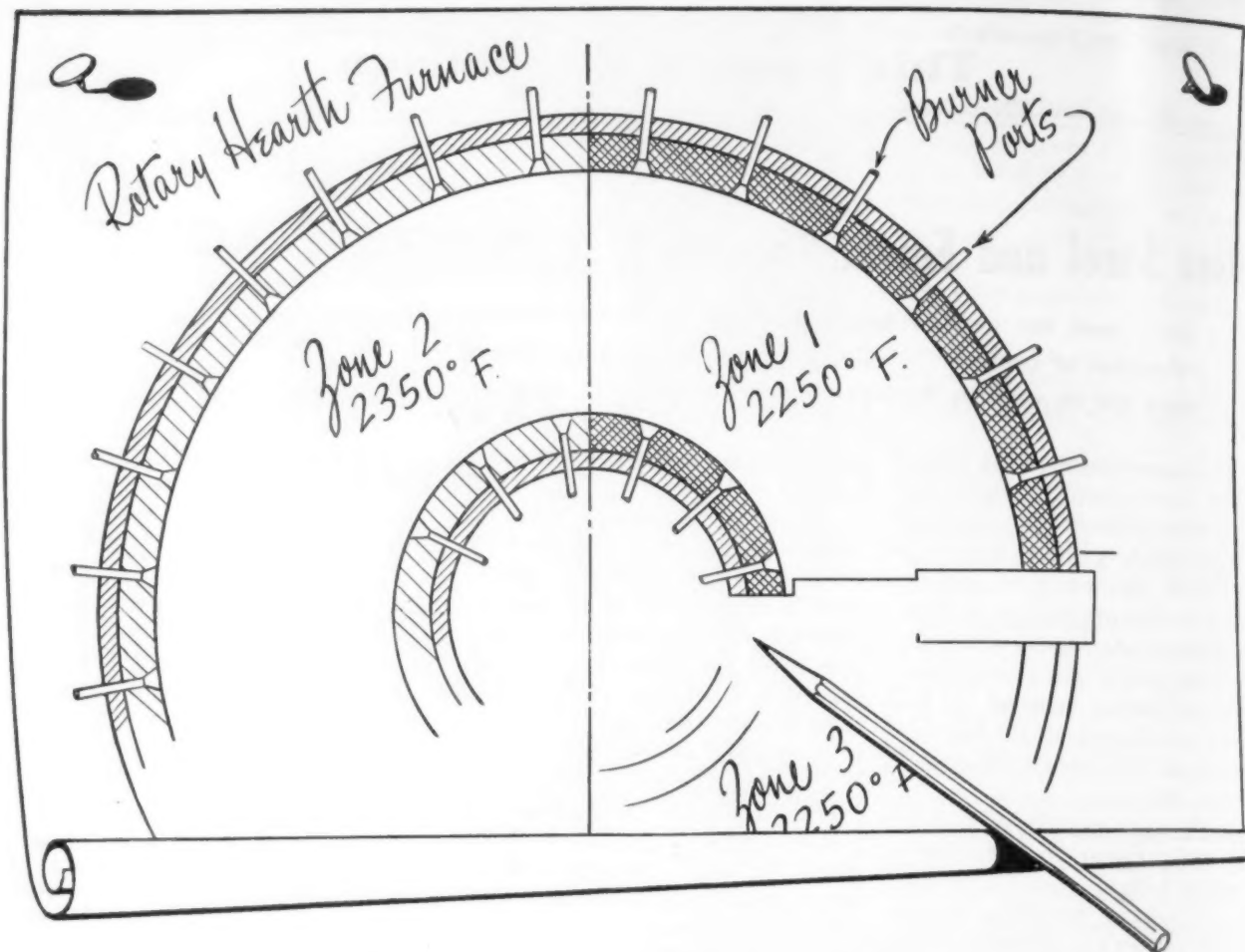
**Fifteen Favor**—Thus far, a total of 15 states are on record as favoring the proposed constitutional amendment. Favorable action by 32 states is necessary for adoption of the amendment. Although 24 states have acted on the proposal, subsequent action at state legislature or executive levels trimmed the net lead to 15 states.

The Capital economists found that adoption of the amendment would "place a strait-jacket on the federal revenue system, and would seriously impair the government's ability to finance essential expenditures."

Specifically, they estimate that federal revenues would be trimmed by more than \$16 billion in terms of 1951 tax rates. Of this figure, about \$14 billion represents tax payments by corporations.



**TAKES OATH:** Harry F. McDonald (right) is sworn in as new head of Reconstruction Finance Corp. by Associate Justice Tom Clark of the Supreme Court in Washington last week.

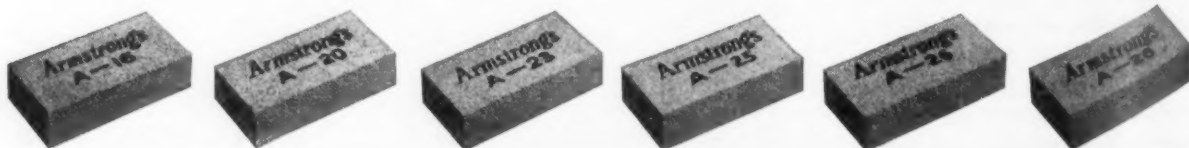


## Which insulating fire brick would you use?

When it comes to selecting insulating fire brick, every furnace presents a new and different problem. Sometimes thermal efficiency and top temperature limit alone dictate brick choice—but more often the brick with the best balance of all desirable properties give you better performance. Take this doughnut-type rotary hearth furnace as an example. It has three temperature zones, with the furnace lining exposed to two temperatures in those zones. In the first and last zones, temperatures of 2250° F. are held. In the heating zone, the temperature is raised to 2350° F. Armstrong's A-23 Insulating Fire Brick were selected for the 9" lining of the first and third zones. That choice was based partly on the high insulating efficiency of those brick. But equally important was the fact that they have the strength to resist spalling, shrinkage, and mechanical abuse to which the lining is subjected. A-26's line the 2350° F. zone. They are made to

hold up under this higher temperature but also have the strength needed to resist spalling and mechanical shock. The high insulating efficiency of both these brick types, plus the extra insulation provided by 4½" of Armstrong's A-16's as back-up insulation, cuts furnace operating costs to a minimum.

All six brick in the Armstrong Line are formulated to give you the best balance of desirable physical properties. They're lightweight and highly efficient insulators, yet have the strength needed to give long life on the job. The next time you are faced with the problem of choosing insulating brick for any furnace application, call in the Armstrong engineer. His advice may help you build a better furnace and may even save you money at the same time. Call the Armstrong office nearest you or write today to Armstrong Cork Company, 4903 Mulberry Street, Lancaster, Pennsylvania.



**ARMSTRONG'S INSULATING REFRACTORIES**

## LABOR: More Jobs in Metalworking

**Government survey shows labor force increasing after bad drop in December . . . Automakers hit hardest by materials cutbacks, but picture is brightening . . . Some quotas raised.**

Metalworking employment hit rock bottom in December, but is now on the way up again—in spite of restrictions on consumer hard goods industries.

This forecast is based on industry reports submitted to the U. S. Bureau of Labor Statistics at the request of Administrator Henry H. Fowler of National Production Authority.

Specifically, employment in the 105 industries surveyed totaled 4,962,000 in January. This was a rise of 22,000 from December.

All metalworking plants known to NPA as having more than 100 employees were covered, plus 3000 firms employing fewer than that figure. Response was nearly 100 pct, and covered 85 pct of the metalworking labor force.

**Automakers Worst Off**—Hardest hit by materials cutbacks during last quarter 1951 and first quarter 1952 was the automobile industry, one of the biggest chewers-up of metal. Employment has steadily declined from a high point last April and May to its mid-January low level.

Fowler points out that the low January level is still only about 13 pct below the figure at the beginning of the Korean war. It had increased nearly 5 pct between June, 1950, and May, 1951, however, making the actual unemployment nearly 20 pct.

The agency head says the loss was not actually this large, since the automotive figures do not include employment in new plants owned by the industry and devoted entirely to defense production along other lines.

**Should Be Brighter**—While most industrial reports projected employment as rising for the remainder of the first quarter, no

forecasts were included for the second quarter. This was because the second quarter allotments had not yet been forecast.

Actually, says Mr. Fowler, the picture should be a little brighter than that projected by industry. Since the survey, some first quarter allotments were increased for hardship and other reasons.

And, he says, now armed with this realistic report by industry, his agency is better equipped to shift and adjust second quarter allocations to meet materials demands and at the same time keep the employment curve continuing on the upgrade.

**Still Up**—As for consumer durables other than motor vehicles, while the employment drop has been considerable, industry reports show that it is still about 112 points above June, 1950. Business estimates project the figure as rising another 3 points by Mar. 31.

These figures and projections, of course, are for the overall picture, and are not necessarily ap-

plicable to specific industrial areas.

But even so, Mr. Fowler believes that with some types of materials becoming softer, nearly all industries can be aided. For instance, more sheet and strip can be made available during second and probably succeeding quarters to manufacturers of consumer hard goods. This policy has already been put into effect.

### Automakers

**Ask metal for 5 million cars . . . Softer markets may provide it.**

Automobile manufacturers are urging the government to allocate enough steel and nonferrous metals to guarantee production of 5 million vehicles this year.

Detroit spokesmen, at a meeting with National Production Authority officials last week, pointed out that dealers' stocks of new automobiles are decreasing rapidly.

Public demand for new cars this year will be strong enough to support easily an output of 5 million units, industry representatives claimed. Unless present allocations are changed, total industry output in 1952 will be about a million cars short of demand.

**Softness Signs**—NPA asked the industry to report the quantities of steel, copper, and aluminum needed to build a million cars in the second quarter, and to report quantities needed for 1.1 million units. (See p. 186.)

Another tip-off regarding softening metal markets was introduced at the meeting by Henry H. Fowler, NPA administrator. Said Mr. Fowler: "We are getting the exact figures on turnbacks from the Defense Dept. of controlled materials allotted for the second quarter, which the services will not need because of rescheduling or review."

Mr. Fowler said NPA is currently obtaining from steel mills reports on any open space remaining. This capacity, he said, will be reassessed against those allotments that have not as yet been placed on the mills.





# Industrial Briefs

**Carolina Steel Book** — CAROLINA STEEL & IRON CO., Greensboro, N. C., has issued a book depicting various phases of its operation in celebration of one-third of a century of service. The book also pays tribute to Salem Steel Co., Winston-Salem, N. C., an affiliate of Carolina. It points up the part these two companies have played in the recent change from an agricultural economy to an industrial economy in the South.

**Welding Clinics**—Three-day welding clinics have been opened by STEEL SALES CORP., Chicago, in its newly completed warehouses at Milwaukee and Minneapolis. Daily demonstrations, in which a variety of metals will be used, will be conducted by representatives of The International Nickel Co., Inc., Aluminum Co. of America, Revere Copper and Brass, Crucible Steel Co. of America, Allis-Chalmers, and National Cylinder Gas Co.

**New Building**—A new half-million dollar warehouse and office building will be constructed at the corner of Northside Drive and 14th St. by the ATLANTIC STEEL CO. for its Warehouse Div. The new location and facilities will provide a larger variety of steel warehouse products. Strother-Barge Co. has been named contractor for the new structure.

**Completion In Sight**—The ALBERT KLINGELHOFER MACHINE TOOL CORP., Westfield, N. J., will soon complete its building in Kenilworth, N. J., for the purpose of maintaining an increased stock of machines and parts accessories. The plant will have extensive manufacturing facilities to insure special adaptations and service as required.

**Technical Visuals**—H. E. Beyster & Associates, Inc., has formed a new division called TECHNICAL VISUALS, INC., at 14620 E. Seven Mile Road, Detroit. This division will specialize in the design and production of catalogs, mechanical literature and technical art, and will serve principally in the fields of building materials, machinery, and industrial equipment.

**Opens Branch Office**—The J. LEE HACKETT MACHINERY CO., Detroit, has opened a branch office at 1144 Hanna Bldg., Cleveland. This branch, in charge of J. Alden Rigdon, represents the Mattison Machine Works, Greenlee Bros. Co., and several other machine tool builders.

**Castings**—Techniques of cast-weld construction and the welding of steel castings were discussed at a meeting of Technical and Operating Group No. 2, STEEL FOUNDERS' SOCIETY OF AMERICA, held in Buffalo. Special attention was given to advanced research and development activities carried out by the technical organization. The steel foundry industry, it was reported, is currently approaching the all-time high established during World War II and is now heavily engaged in production of defense items.

**Division Expands**—The tube division, SOUTHEASTERN METALS CO., Birmingham, has purchased an entire city block on part of which an extension of the plant will be built at a total investment of about \$400,000. The new building will contain 36,000 ft of floor space and will house the company's new chromium plating facilities.

**Training Course**—During the week of Aug. 24, 1952, a training course for junior executives of the scrap industry will be held by the INSTITUTE OF SCRAP IRON & STEEL, at Carnegie Institute of Technology, Pittsburgh. No enrollments will be accepted until announcement has been made of the requirements for admission.

**District Facilities** — COOPER-BESSEMER CORP., Mount Vernon, Ohio, has established a combined regional office and warehouse at New Orleans. The new facilities, under the direction of T. E. Kraner, branch manager, provide direct factory representation for all engineering service requirements on engine and compressor applications.

**Takes Over**—NATIONAL MALLEABLE & STEEL CASTINGS CO., Cleveland, has purchased the Capitol Foundry Co., Phoenix, Ariz., and Capitol's subsidiary, the Arizona Iron Works, which will be operated as subsidiaries of National Malleable. A \$1.5 million expansion and improvement program will be undertaken immediately. Electric melting furnaces and other equipment to produce cast steel grinding balls as well as to expand its production of miscellaneous steel, iron and alloy castings, will be installed.

**Makes Purchase**—R. HOE & CO., INC., power saw manufacturer, has purchased the building it now occupies as a warehouse in Birmingham. Two adjoining lots also were purchased to provide room for expansion.

**Program Planned**—ALUMINUM ORE CO., has planned a \$12 million expansion program for its alumina plant in Mobile, Ala. The expansion program, dependent upon availability of building materials, should begin by next January.

**Division Consolidated**—MOTOROLA INC., Chicago, has established its National Defense Div. headquarters in its 187,000-sq-ft Clybourne Ave. plant, to insure the most efficient handling of its mounting volume of military orders. This plant, plus another 50,000-sq-ft plant, will be devoted entirely to military production.



"The new salesman? He's down there having his lunch."

# Reduce the use of critical alloys in gas turbine structures

N-A-X AC9115 ALLOY STEEL offers a means of reducing the use of critical alloy steels of the "stainless" type in gas turbine and similar applications. In specific cases it has replaced over half the amount of strategic material originally required, with no sacrifice of quality.

N-A-X AC9115 ALLOY STEEL has high strength and toughness values at temperatures ranging from  $-70^{\circ}\text{F.}$  to  $+1,000^{\circ}\text{F.}$  It can be readily cold formed into the most difficult shapes; its response to welding by any process is excellent. It must, however, be suitably coated for protection against cold or hot corrosion.

N-A-X AC9115 ALLOY STEEL is available in bars as well as flat rolled products. Investigate the outstanding properties and characteristics of this steel and, through its use, conserve the critical material so necessary to our nation.



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# The Automotive Assembly Line

## Quota Boost Hope Cheers Industry

**Both labor and management optimistic over NPA prediction of raising second quarter output to 1 million . . . Copper is worst shortage now . . . Aluminum easier—By R. D. Raddant.**

The entire automobile industry was encouraged by predictions of the National Production Authority that the second quarter auto quotas will be increased from 930,000 to 1 million.

Both the automobile companies, radiating confidence they can sell just about all the cars they can put out, and the labor force, facing a continued and serious unemployment problem, received a boost in morale from the announcement. Best estimates are that there are about 100,000 jobless in Detroit.

To permit the increase in production, 1 to 2 million pounds of copper must be made available to the industry. Copper now seems to be the major obstacle to increased production. More aluminum was recently channeled to the auto industry and there is no evidence that shortages of steel are holding up production.

After a slow start in 1952, automobile production speeded up and the February output should reach 332,000 cars and 103,000 trucks. In January, automobile plants turned out 286,855 cars and 103,932 trucks. Saturday assembly in some Ford plants and speeded up production at Nash accounted for most of the February increase.

**Plastic Bodies**—The idea of plastic automobile body construction, which has appeared and disappeared from time to time in the past decade, is being revived in experiments of the U. S. Rubber Co.

The new body was built for U. S. Rubber by the Glasspar Co. of Costa Mesa, Calif., and is said to have overcome some of the obstacles that resulted in the failure of previous attempts at plastic automobile design.

The new plastic body requires no heat or pressure to mold and can be made for about \$625. It is made by laying successive layers of polyester resin, Owens-Corning Fiberglas matting and Fiberglas cloth on a form.

### They Don't Want More Steel

Detroit automakers last week admitted that they had spurned a National Production Authority offer of 10 pct more steel this quarter. Spokesmen for the car builders said NPA also offered a substantial increase for the second quarter.

There have been no reports of cancellations of mill orders, but the automobile industry has been rejecting offers of steel from new sources. The big need in Detroit is copper, with aluminum coming next.

Some Detroit executives say that steel may become even softer should prices and credit curbs hurt sales. General feeling is they can sell all the cars they can make, and have plenty of steel to make them.

**Not Worried**—Auto companies paid little or no attention to rumblings in the UAW-CIO that sound like an acceleration of demands for a guaranteed annual wage. This intention to hurry things along was twice repeated recently by UAW President Walter P. Reuther.

A spokesman for one automobile company pointed out that the current contract which includes the famous "escalator" clause still has 3 years to run and Mr. Reuther's prodding the issue "sounded like

politics to keep interest alive until the expiration date."

He also said that technical improvements that have cut down model change layoffs to much shorter intervals plus a more continuous operation of assembly lines in recent years have cut the luster from this once very bright piece of bait.

**Under Study**—The so-called single service procurement plan under which the Army has done the purchasing of all types of motor vehicles for all services will be studied by the University of Michigan School of Business Administration.

The project, known as the Tank-Automotive Procurement study, will probe the effectiveness of the system and may throw considerable light on the over-all procurement policies of the Army, Navy and Air Force.

**Copper Source**—The automotive industry was sounded out by Governor G. Mennen Williams on the unique proposition of literally "bailing out" part of the northern Michigan copper field.

Acting as the middleman between the Calumet and Hecla Consolidated Copper Co. and copper-hungry automobile companies, the governor made his proposal at a meeting with representatives of the mining company and General Motors, Chrysler, and Ford, and Nash-Kelvinator.

Calumet officials said that they own two mines, now closed, that can produce 45 to 50 million lb of copper annually. The hitch is that 9 million gal of water now flood the mines. Bailing out would cost \$19 million.

The governor suggested that the auto industry buy the copper produced at the mines for a price  $1\frac{1}{2}\epsilon$  to  $4\frac{1}{2}\epsilon$  above the domestic ceiling price of  $24\frac{1}{2}\epsilon$  a lb. With this agreement, subject to federal approval, the mine could no doubt obtain a loan to reopen the mines.



## WAGES: Boosted By Living Costs

Price index rise adds 3¢ per hr at quarterly review of escalator contracts . . . Raises under cost-of-living agreements now total 24¢ . . . GM opposed to federal unemployment relief.

Upward spiraling of living costs added 3¢ per hr to the base pay of more than 1 million automobile workers as the quarterly review of "escalator" agreements in union contracts went into effect at the end of February.

The latest pay raises brought to a total of 24¢ pay raises granted by the auto industry under the "escalator" clause pioneered by General Motors and the United Auto Workers in 1948.

On only three occasions have the autoworkers taken pay cuts under the agreements while four quarterly periods resulted in no change in pay rates. Under escalator formula, wages and salaries are reviewed quarterly and adjusted on the basis of the consumer price index of the U. S. Bureau of Labor Statistics. The BLS jumped from 187.8 for October, 1951 to 190.2 for January, 1952. About 150,000 salaried employees will share in comparable increases. The raise will bring straight time hourly rates close to \$2.00 and add an estimated \$60 million a year to auto payrolls.

**Opposes Dole**—General Motors indicated its opposition to the bill introduced recently by Senator Blair Moody to provide Federal aid to state unemployment payments to workers laid off because of defense cutbacks.

In a carefully worded letter to Mr. Moody and UAW President Walter P. Reuther, Harlow H. Curtice, executive vice-president stated:

"The automotive industry and the workmen in it are being unfairly discriminated against. I am sure the workmen in the automotive industry want fair treatment, jobs and an opportunity to earn a living—not unemployment dole."

Mr. Curtice declared that GM

material shortages which were forcing cutbacks in production "appear to us to be statistical rather than real."

### More Auto Production Recommend

Automobile production must be boosted to the 1 million car level in the second quarter if new defense jobs are not created in the nation's auto-making centers by that time.

This recommendation, issued late last week by a government task force on unemployment problems, was coupled with a warning to mobilization planners against "excessive" cuts in vehicle output.

The task force said that about \$500,000,000 in defense will be placed in the Detroit area during

the first 5 months of 1952. But it pointed out that new contracts are not the answer to the industry's unemployment problem. It recommended a reduction in the time-lag that usually occurs before contracts are translated into jobs.

In addition to the Detroit area, the manpower committee recommended the awarding of more defense contracts to the areas around Providence, Scranton, Pa., and Wilkes-Barre, Pa. The committee says at least 6 pct of the working forces in these areas are now unemployed.

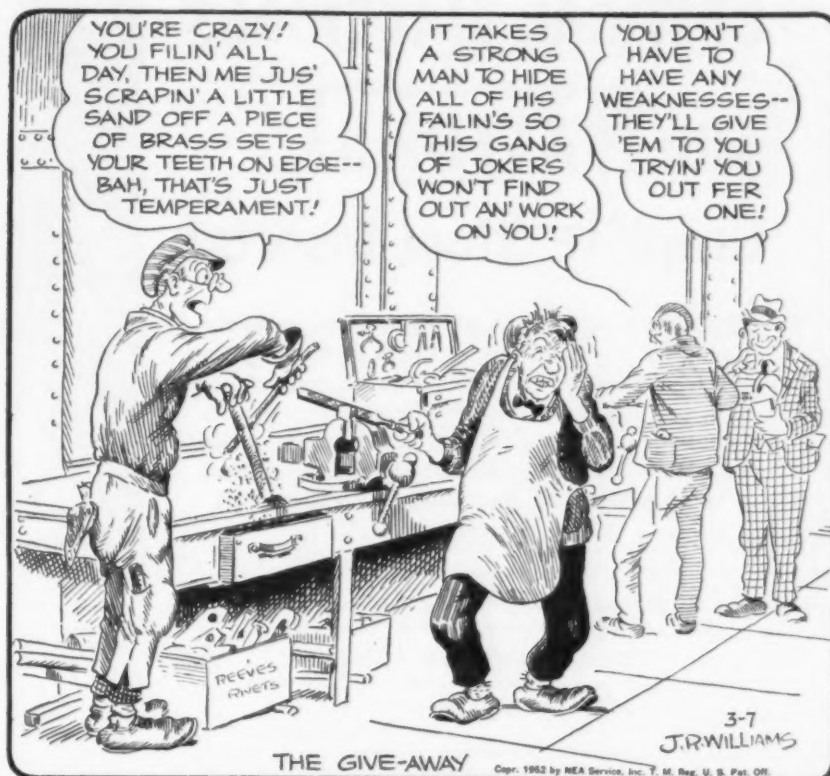
### AC Expands for Defense Output

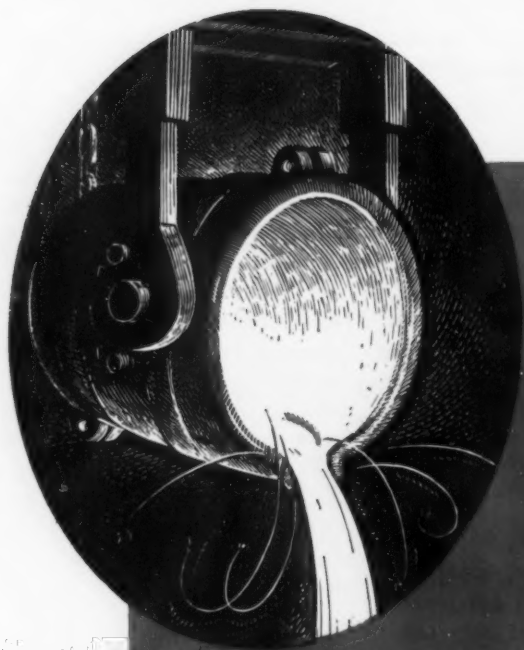
About 20 pct of the employees of AC Spark Plug Div. at Flint, Mich., are working on defense projects, according to George Mann, Jr., general manager.

New AC buildings now under construction for defense production will be finished in July. The entire defense building program will add ½ million sq ft of space to be completed by September.

## THE BULL OF THE WOODS

By J. R. Williams





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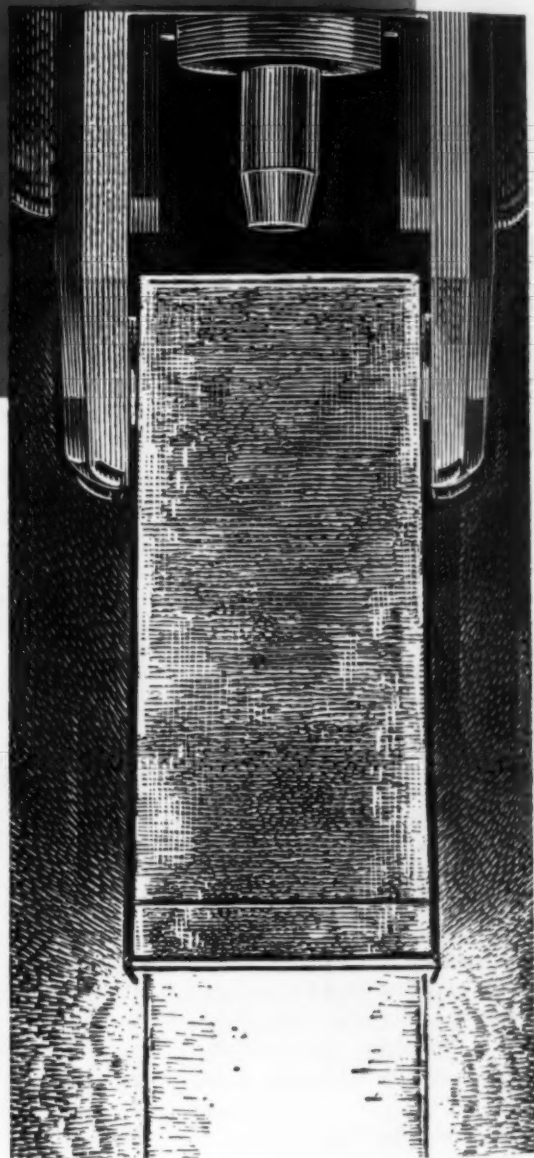
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## West Coast Report

### U. S. Steel Plans Western Plants

**Olds tells of revised expansion program for West Coast . . .  
L. A. mill cancelled by defense needs . . . Future emphasis will  
be on civilian goods facilities at Torrance Steel plant.**

That U. S. Steel hasn't forgotten the West Coast in its expansion plans was made very clear by Irving S. Olds, chairman of the board, and Alden G. Roach, president, Columbia-Geneva Div., during Mr. Olds' recent tour of western facilities.

Abandonment of plans announced 3 years ago for the establishment of a cold reduction mill in the former aluminum reduction plant at Los Angeles was explained by the need to give priority to projects more directly connected with defense. Rolling mills originally planned for the L. A. plant have been installed at Pittsburg, Calif., and will be in full operation within a few months.

**Present Plans**—According to Mr. Olds, U. S. Steel expansion in southern California will be in the direction of constructing "modern facilities at its Torrance plant for the production of certain steel products which are essentially of a peacetime character." He didn't enlarge on the nature of the products contemplated, but it is believed the corporation is considering both merchant pipe and wire products.

Mr. Roach indicated that an additional openhearth is under consideration for Torrance. At present there are four 58-ton openhearth and one 56-ton electric furnace.

Time-wise, Mr. Olds stated: "This program, which will involve the expenditure of a large sum of money, will actively be undertaken and completed by U. S. Steel as soon as it is practical to do so, consistent with U. S. Steel's obligation under the national military and defense programs."

**No Blast Furnace**—In view of the metallic shortage in the West and the economic availability of Venezuelan iron ore when Cerro Bolivar starts producing, there has been some conjecture as to the possibility of U. S. Steel putting in a West Coast blast furnace. To this, Mr. Olds said "Not contemplated."

The board chairman also made it clear that the Corporation is not considering any type of operation in the Pacific Northwest.

**Still More Ore**—Utah Construction Co. of San Francisco is now going abroad for iron ore. Last week it signed a contract with a Peruvian government corporation to develop a promising deposit 300 miles south of Lima.

Extent of the ore body is still undetermined, but Allen D. Christensen, executive vice-president of the company, contemplates shipments of from 100,000 to 200,000 tons per month to eastern blast furnaces and possibly Japan. It is also planned to supply 300,000 tons per year to a steelmaking project

of the Peruvian government 300 miles north of Lima. Royalties to the Peruvian government were not revealed, but cost of opening the deposit will approximate \$5 million.

Utah Construction is already engaged in extensive iron ore mining in Utah and Vancouver Island, B. C., and is exploring for iron ore in Nevada.

**Muddled Mess**—While National Production Authority administrators are only confused by the current slackening in demand for aluminum, users of the light metal in the West are baffled.

Manufacturers of irrigation equipment have been told they won't get much, if any, aluminum in the second quarter, and other fabricators are in a similar position. Window frame manufacturers claim they are about out of business (some are). Other small fabricators using aluminum to produce ladders, cooking utensils, etc., are in the same class.

Admittedly, NPA is at least slightly embarrassed by the lack of interest shown by holders of CMP tickets for aluminum and is wondering if allocations have been too heavy in some directions and too light in others.

Best guess: With increased capacity coming into production now, imports under the steel-for-aluminum dicker with Great Britain, and still more capacity coming in about June, aluminum will be among the most readily available metals in the U. S. within a few months.

**Conversion**—Puget Sound Bridge and Dredging Co., Seattle, Wash., will convert a landing ship, tank (LST) to a battle damage repair ship (ARB) under terms of a \$1,624,825 Navy contract.

Another Seattle firm, W. C. Nickum and Sons, is preparing detailed plans for the conversion.





FACTS TELL THE STORY...

# NEW CK MILLING MACHINE PAYS USER BIG PRODUCTION DIVIDEND



CK Milling Machine Features that helped do this job BETTER



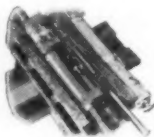
New CK column easily absorbed vibration from heavy cutting load.



CK's large (2" dia.) screw and extra-long table feed nut permitted heavy cut.



No. 60 heavy-duty drive flange on spindle drives heavy-duty arbor with multiple cutters.



CK's positive, metered, pressure and automatic lubrication assured wear-free operation.



Greater Horsepower of CK machine meant maximum results from modern cutting tools.



CK's 3-bearing spindle and fly-wheel assured fastest metal removal with desired finish.



24 different spindle speeds (13 to 1300 rpm) plus 32 different table feeds (1/8" to 90 ipm) meant operator selected exact combination to get fullest advantage from high horsepower and modern cutting tools.

## The FACTS on this job are:

**Machine:** New 25hp No. 5, Model CK Plain.

**Material:** Cast Steel, 150 Brinell.

**Feed:** 4 1/2 inches per minute.

**Cutter Speed:** 100 Surface feet per minute.

**Rate of metal removal:** 17.5 cu. in. per min.

**Production rate:** 4 parts per hour.

**NOTE:** Each part requires but a *single pass* of the cutter on the new Kearney & Trecker CK machine.

Old production rate 1 1/2 parts per hour with two passes required per piece.

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**MACHINE TOOLS**



## Machine Tool High Spots

### NPA Throws Oil on Troubled Waters

**Cancellations not a cutback in military programs, industry is told . . . Decreased emphasis on obsolescent equipment, less urgency . . . Japanese tools a disappointment—By G. Elwers.**

National Production Authority has reassured the machine tool industry that the bottom is not dropping out of its market. Alarmed by mounting cancellations, the Machine Tool Industry Advisory Committee asked NPA what was up.

NPA replied that current cancellations do not result from a cutback in the military program itself. All that is going on is decreased emphasis on equipment the Air Force now considers obsolete. The cancellation of machine tools to make aircraft propellers has been cited.

**More Time**—Neither the basic defense production goals, nor the extent of the facilities expansion program, have been altered, according to NPA. But the time allotted to meet these goals has been upped by a year.

NPA now estimates that \$1 billion in machine tool orders will be placed this year. Added to the current backlog of about \$1.3 billion, this represents plenty of reason for machine tool builders to continue trying to expand their output, NPA said.

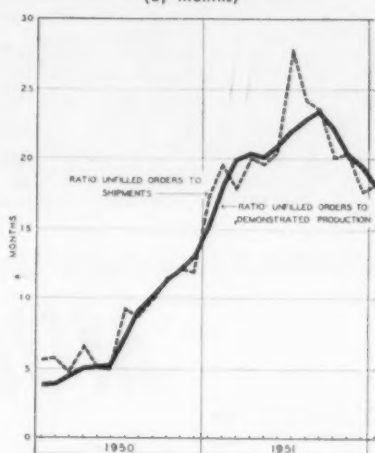
**Not There**—Reports that there are several thousand machine tools in Japan which could help the U. S. defense effort have proved to be groundless. A preliminary report by the 3-man NPA mission which just returned from Japan says only about 150 acceptable machine tools could be found.

The mission inspected over 25,000 machine tools—a far lower figure than the reported 200,000 tools in Japanese reparations re-

serves. Of the tools inspected, about 7000 had been originally shipped from America to Japan.

Few of these 7000 machines were of critical types. There were very few heavy planers, horizontal boring mills, large vertical turret lathes, or other types in particularly short supply here. Milling machines, small radial drills, and turret lathes dominated the list of 150 acceptable machine tools which the mission located.

Machine Tool Deliveries  
(By Months)



**For Sale**—Since reparations payments have been arranged for in other ways than by sending machine tools, any of the machine tools of U. S. or European make which U. S. manufacturers want will have to be purchased from their Japanese owners, the mission report says.

About 33 companies in Japan are now producing machine tools, the mission members found. Annual output is about 5000 units. The industry is in a depressed state.

It has in the past done much

copying of American and European designs, without achieving high quality. Much original design and development work must be done before Japan can export machine tools.

**Has Capacity**—On the asset side, the industry has capacity and workers to turn out more machine tools than present production levels require. And management there is willing to make anything. Thus if desired, the U. S. can have machine tools built for it in Japan.

However, the mission's report concludes, the quality rating of such machines would be lower than is achieved by American machine tool builders.

Members of the mission included N. B. Clark of NPA, Charles DeVlieg, DeVlieg Machine Co., and Howard Kellog, representing machine tool buyers.

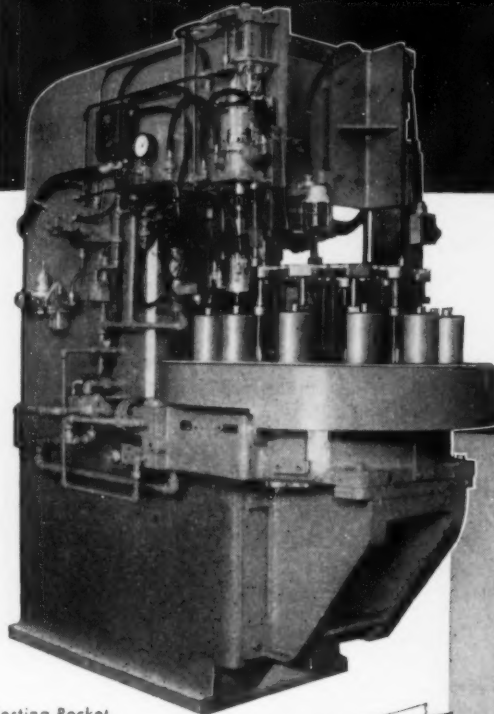
**Getting Them Back**—More machine tools are being recovered from educational institutions for use in defense plants. So far about 260 units have been recovered and placed on production work. Nobody knows how many more such tools are available. Guesses run all the way from 5000 to 25,000.

These are World War II surplus tools which had been given or lent to school machine shops by the government. Now the NPA is buying or taking them back, and leasing them to defense contractors.

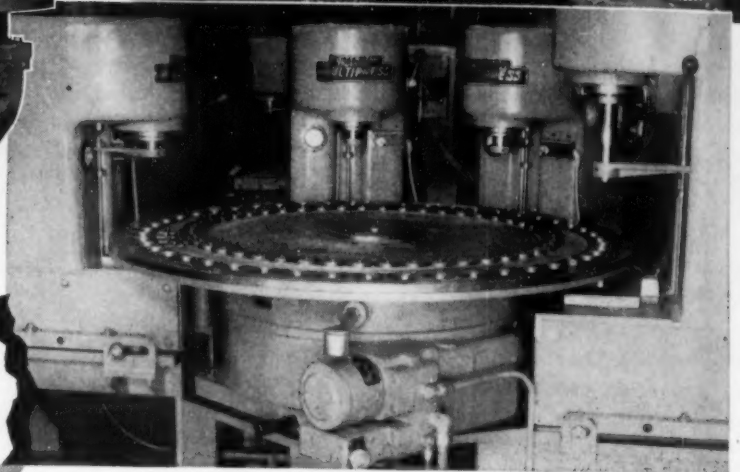
**Index Up**—New orders for machine tools as measured by the National Machine Tool Builders' Assn. index, rose in January to 381. The December figure was 376.5. Shipments increased from 264.7 to 266.3 in January. The demonstrated production rate rose from 247.7 to 259. The backlog, in terms of months production, dropped to 18.1. This is the lowest level for this figure since February, 1951.

# DENISON INDEX TABLES

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# *The* **Iron Age**

## **SALUTES**

*J. J. Demuth*

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**W**HEN the chips are down and the pressure on, one of the toughest jobs in today's manufacturing setup is that of the tool engineer. On his knowledge and skill are built the production records industry and the nation dream of.

Jake Demuth, 1951 president of the American Society of Tool Engineers, has built a solid record of achievement. Key to Jake's success as a tool engineer is his wealth of ability and the quiet, dynamic manner with which he meets people and problems.

Jake spent most of his life around St. Louis, Mo. He started out as a trade school apprentice and worked his way through the ranks in shop after shop. It was an unexcelled training ground—one from which have come the host of able toolmen who make possible day-to-day production miracles.

In the past 15 years Jake Demuth has worked closely with industry and government. In 1939 he worked with the St. Louis Ordnance District to purchase production equipment for U. S. Cartridge Co. In 1942 he received the thanks of Lieutenant General Knudsen in meeting aircraft turret schedules at Emerson Electric Co. In 1944 Jake supervised tooling for production of Pratt & Whitney aircraft engines at Kansas City.

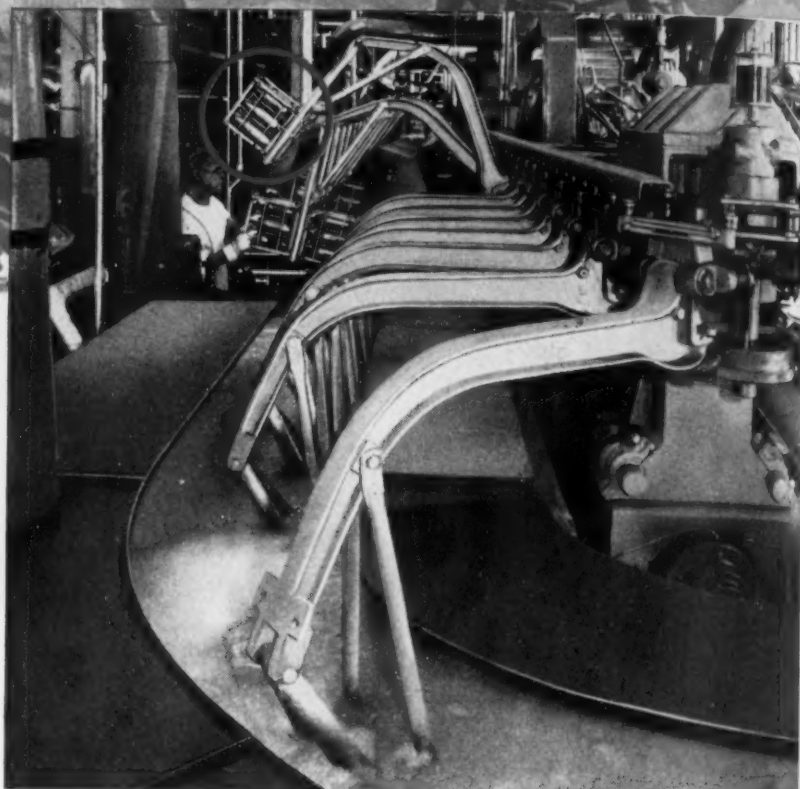
Aside from his duties in Washington, where he is serving with the NPA, Jake is directing the organization of the largest industrial exposition in ASTE history.

Like a lot of busy men, Jake finds relaxation from the terrific pace of everyday living in farm life, raising thoroughbred cattle.



## MAN and MACHINE BEHIND THE GUN

### *Stevens* PICKLING MACHINE SPURS BAZOOKA SHELL OUTPUT



The combat soldier's bazooka is his sling of David against the Goliath of enemy armor. If his first shot doesn't score, the gunner gets no second chance. So bazooka rockets must be as nearly flawless as man and machine can make them.

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# The Iron Age

## INTRODUCES

Christian E. Jarchow, formerly vice-president and comptroller, elected executive vice-president, INTERNATIONAL HARVESTER CO., Chicago; and Robert P. Messenger, formerly executive vice-president for foreign operations, assumes executive direction of manufacturing, engineering, steel, and fiber and twine functions of the company. Mr. Jarchow will also continue as controller.

P. M. Cobb, formerly vice-president in charge of sales, San Francisco District, appointed vice-president, sales; and Ralph W. Seely, vice-president, Maywood plant, appointed vice-president and assistant to the president, Consolidated Western Steel Div., U. S. STEEL CO., San Francisco.

B. Bronzan, appointed vice-president and general manager, Adel Div., GENERAL METALS CORP., Oakland, Calif.

Zay B. Curtis, Jr., appointed assistant to the president, C. H. WHEELER MFG. CO., Philadelphia; and John M. Sperry, appointed sales manager, Heating Pump Dept., Economy Pump Div.

James C. Steffan, appointed vice-president and general sales manager, CHICAGO STEEL & WIRE CO., Chicago.

W. Frank Kelly, appointed assistant vice-president, and John E. Holtman, appointed general superintendent of foundries, American Manganese Steel Div., AMERICAN BRAKE SHOE CO., New York.

J. B. French, named assistant to the vice-president, Utah Operations; and J. L. Fullerton, appointed superintendent, Production Planning, Columbia-Geneva Steel Div., U. S. STEEL CO., Salt Lake City.

Edward W. Miller, president, FELLOWS GEAR SHAPER CO., Springfield, Vermont, also elected general manager; Edwin R. Fellows, II, elected a director and appointed assistant general manager; and Roger M. Knox, named assistant to the president.

Meade F. Moore, elected vice-president in charge of research, Nash Motors Div., NASH - KELVINATOR CORP., Detroit.

William S. Ginn, appointed general manager, Power Transformer Dept.; Raymond W. Smith, appointed general manager, Distribution Transformer Dept.; Alfred W. Hough, appointed general manager, Capacitor Dept.; and Dr. Karl B. McEachron, appointed manager, Laboratory - Engineering Dept., GENERAL ELECTRIC CO., Pittsfield, Mass.

Nelson C. Dezendorf, appointed general manager, Electro-Motive Div., La Grange, Ill., GENERAL MOTORS CORP., Detroit.

Roy A. Allen, promoted to sales manager, and Marion E. Graff, promoted to assistant sales manager, RICH STEEL CO., Los Angeles.

Roy C. Heacock, promoted to chief engineer in charge of development and engineering, BARBER-GREENE CO., Aurora, Ill.

Noble B. Clark, appointed sales manager, Machine Tool Div., WARNER & SWASEY CO., Cleveland.

Carl A. Salmonsens, appointed general manager, newly formed Industry Control Dept., GENERAL ELECTRIC CO., Philadelphia.

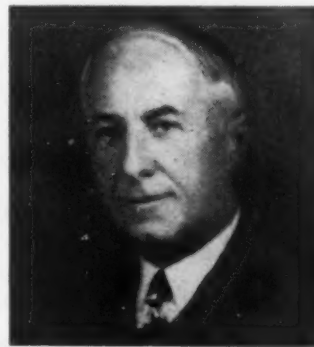
Jules Alexandre, appointed sales manager, APPLIANCE MFG. CO., Alliance, Ohio.



JOHN S. EWING, appointed manager, stainless steel sales, U. S. Steel Co., Pittsburgh. He succeeds Paul F. Voigt, Jr., who has retired.



W. D. ROBINSON, named chairman of the board, Briggs Mfg. Co., Detroit. He succeeds the late Walter O. Briggs.



EVERETT E. LUNDBERG, succeeds W. D. Robinson as president and general manager, Briggs Mfg. Co., Detroit.



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2200 V. 236 RPM. Type MT-30-2000-240  
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## Personnel

Continued

John K. Beidler, appointed general manager, Machinery Div., DRAVO CORP., Pittsburgh. He was also elected a director and a vice-president, Dravo-Doyle Co., a subsidiary.

Chris H. Bartlett, appointed manager, Transformer Div., WESTINGHOUSE ELECTRIC CORP., Sharon, Pa. Mr. Bartlett succeeds Frank L. Snyder, who was named manager, Westinghouse Aviation Gas Turbine Div., Philadelphia, last year.

J. P. Little, appointed sales manager, Exeter Brass Div., BRIDGEPORT BRASS CO., Bridgeport, Conn.

John T. Weber, named manager, sales development, CUMMINS ENGINE CO., INC., Columbus, Ind. Mr. Weber succeeds Howard P. Sharp, who resigned.

A. H. Knief, appointed regional manager, DAVEY COMPRESSOR CO., Kent, Ohio. He will have headquarters in Milwaukee.

William H. Funk, named assistant manager, Development Engineering Dept., LUKENS STEEL CO., Coatesville, Pa.

Edmond M. Wagner, appointed to the newly created position of director of engineering and manufacturing, West Coast Operations, EKCO PRODUCTS CO., Chicago. Mr. Wagner will make his headquarters in Whittier, Calif.

Donald L. Taylor—appointed manager of general developments, development and research department, HOOKER ELECTROCHEMICAL CO., Niagara Falls N. Y.

Edward M. Meyer, formerly manager, Chicago warehouse, appointed territorial representative, Northwestern Illinois, Iowa, and Nebraska, BLISS & LAUGHLIN, INC., Harvey, Ill.

Richard C. Lawson, appointed assistant manager, Railroad and Spring Sales Dept., CRUCIBLE STEEL CO. OF AMERICA. Mr. Lawson's headquarters will be in New York.

Wallace A. Doepel, appointed assistant sales manager, ARTHUR COLTON CO., a division of Snyder Tool & Engineering Co., Detroit.

R. W. Stetson, joins the Cathodic Protection Sales group, Magnesium Dept., DOW CHEMICAL CO., Midland, Mich.



WILLIAM J. DURING, promoted to executive vice-president and general manager, Precision Castings Co., Inc., Fayetteville, N. Y.



THOMAS E. LLOYD, appointed assistant to the president, Salem Brosius, Inc., Pittsburgh.



CHARLES D. HAXBY, elected a vice-president, Rust Engineering Co., Pittsburgh.



S. W. GALLOWAY, elected a vice-president, Rust Engineering Co., Pittsburgh.

Grind more with less—

*The Iron Age*  
FOUNDED 1855  
**Technical Articles**



## What You Can Do About THE DIAMOND WHEEL SHORTAGE



By L. R. Metzger  
President  
Super-Cut, Inc.  
Chicago

Our economy today is highly dependent on the use of diamonds for truing grinding wheels used in precision, close-tolerance grinding of engine and machine parts and cemented carbide tools.

Promised deliveries of some size meshes range from 50 to 64 weeks. The complaints pouring into Washington have been growing to a point where their quantity and urgency is now of great importance to top level personnel. Recently announced controls on industrial diamonds and diamond wheels make conservation a critical necessity.

This shortage is not caused by insufficient wheel-making capacity, but by a shortage of diamonds themselves. Can the supply be increased? Maybe it can, but it seems wiser to assume that it cannot to any great extent.

An increase in the supply of diamonds can come only from one of two sources: either from the national stockpile or from the original source in Africa. This is where practically all the crushing bort for diamond wheels is found. Many attempts have been made to obtain release of a quantity of diamonds from the stockpile. However, all such requests have met with the same blunt refusal and a statement that the stockpile is only for a critical national emergency such as a full-scale shooting war. The material will not be released without a presidential order. No figures are made public as to

More of the diamond wheels used for grinding tools and parts will be needed in 1952-53 than in peak World War II years—but diamond bort imports will be down one-third. So conservation and other metal-removal methods must fill in. Wheel dust from both wet and dry grinding is being reclaimed. Improved wheel bonding materials and coolants are multiplying wheel life.

### AMERICAN SOCIETY OF TOOL ENGINEERS INDUSTRIAL EXPOSITION— 26TH ANNUAL MEETING

Chicago, March 17-21, 1952

#### REGISTRATION

9 am—5 pm daily

At Exposition or at any of these hotels: Conrad Hilton, Palmer House, Blackstone, Morrison, LaSalle, Harrison

#### EXPOSITION

9 am—6 pm daily

At International Amphitheatre, Chicago Stockyards

#### TECHNICAL SESSIONS

9 am; 1:30, 2:10, 2:50, 3:30, 8 pm daily

At Stockyards Inn, next to Amphitheatre; Conrad Hilton Hotel, 720 S. Michigan Ave.; Palmer House, 15 E. Monroe St.

#### PLANT TOURS

Daily at 9 am

Registration and departures at and from Conrad Hilton Hotel

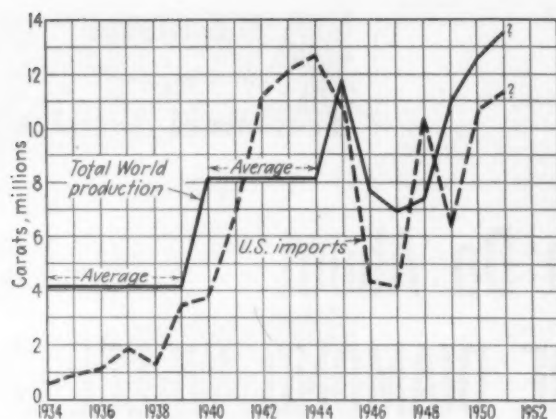


FIG. 1—From these curves, it is clear that the United States has long been getting the bulk of the world's industrial diamonds. Source: U. S. Bureau of Mines.

#### Diamond wheel shortage (continued)

the amount in the stockpile nor the amount being added to it annually.

It is interesting to analyze Figs. 1 and 2. The first compares the total U. S. imports of industrial diamonds with the total mined in the world. This shows we get the largest share of such diamonds. Unfortunately, the present information does not separate diamonds used for industrial diamond tools from material used in crushing bort to go into diamond wheels. A conservative estimate would be that the latter is approximately 80 pct of the total U. S. industrial diamond imports.

Cemented carbides really came into large use in 1941. Fig. 1 shows why, prior to that date, there had accumulated a stockpile of material on hand as compared with consumption suitable for diamond wheels. In this stockpile there was a surplus of 20 million carats to go into diamond wheels. Of this, 11 million was in England and 9 million in Africa or elsewhere. After 1941, Fig. 1 shows we imported more than was mined and this stockpile was used up by the end of the war. Since then, the amount of material available for shipment to this country has been directly dependent on the amount of material mined annually.

Note how the curve of industrial diamond imports in Fig. 2 parallels that of cemented carbides produced. From estimated figures avail-

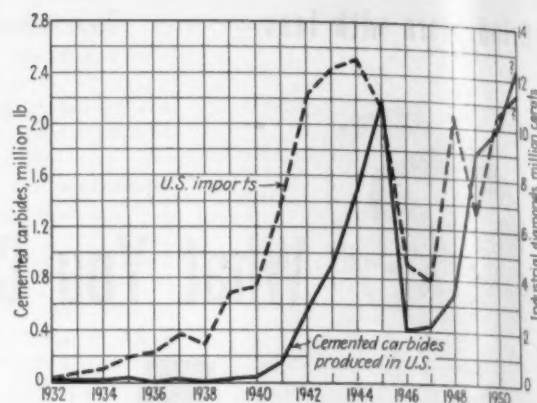


FIG. 2—These curves show that the volume of industrial diamond imports has always been a critical factor in U. S. cemented carbides production. Production for some defense items not included. Source: U. S. Bureau of Mines.

able for 1951, it will be seen that the curves for cemented carbides production is going up faster than the curve for imports.

Production figures given for cemented carbides manufactured in the U. S. in 1951, as reflected in Fig. 2, do not include the use of such carbides for shell cores and certain other new defense items. It must be borne in mind that the Carboloy Dept. of General Electric Co., a big producer, was on strike the last 3 months of 1951.

We are advised that in the years 1952 and 1953 the national defense efforts will require more cemented carbide grinding than the peak war years between 1942 and 1945. During those years, imports into this country included the 20 million carat surplus at the beginning of the war—and there is no such surplus on hand now.

Thus, in 1952 and 1953 it is probable that carbide grinding requirements will be much higher than in the peak war year. Crushing bort imports may be expected, at best, to be only two-thirds as much as was received during those same years.

To arrive at practical solutions, it is necessary first to estimate how much of the crushing bort imports are used for the various purposes for which diamond wheels are made. Figures in Table I are the last available estimates.

Conservation in the cemented carbide field must be improved. At the same time, general overall measures aimed at conserving materials in the smaller applications mentioned must also be stressed.

Better methods of crushing should constantly be sought. Very little diamond powder finer than 325 mesh, is used for grinding carbide. Yet it is reported an average 26 pct of the diamond powder crushed to this in America is finer than 325 mesh. It is stated that diamonds crush unpredictably. That is, the amount obtained in various sizes from one crushing to the next does not follow any fixed formula.

TABLE I  
HOW CRUSHING BORT IS USED

| Application  | Total crushing bort imports, pct |
|--|----------------------------------|
| Diamond wheels for grinding cemented carbides .....              | 80.4                             |
| Diamond saws of all kinds .....                                  | 6.0                              |
| Glass, quartz, grinding and optical curve generators .....       | 3.0                              |
| Diamond dressing tools, drills, dental tools, optical lapa. .... | 4.3                              |
| Diamond and carbide wire dies, and other dies .....              | 4.3                              |
| Diamond compounds for lapping .....                              | 1.5                              |
| Miscellaneous small uses .....                                   | 0.5                              |
|  | 100.0                            |



## GOOD GRINDING PRACTICE

1. Operators should be taught that in offhand grinding too much pressure gives little if any more speed of grinding. It does glaze or load up a metal or vitrified bonded wheel and helps deform a resin bonded wheel all of which demands unnecessary dressing of the wheel and a waste of diamonds.

2. In offhand grinding the operator should traverse and oscillate the tool across the face of the wheel. The tool should not be held stationary against one part of the surface. The latter causes grooving of the wheel, unnecessary dressing and waste of diamonds.

3. It is much better to have a centralized grinding room where a few skilled or properly trained operators handle all the work. Letting just anyone use the wheel is wasteful.

4. Carbide tools should be ground frequently, before they get chipped or suffer a complete failure. It takes less time and diamonds to regrind a partly worn tool than one completely worn out. A partly worn out tool does not perform efficiently anyway.

All machines using diamond wheels should be checked constantly. The best surface feet per minute for grinding carbides is between 5000 and 6200.

Industrial Distributors (1946) Ltd., whose London sales organization is Industrial Distributors (Sales) Ltd., has been experimenting in its research laboratory at Johannesburg. It claims to have reduced the percentage of material finer than 325 mesh to less than 6 pct. Such reduction would mean that with an annual import of, say, 7,000,000 carats of bort an additional available supply of powder for wheel sizes of 1,400,000 carats would be available.

To obtain more material usable in wheels, intensive salvage operations should also be conducted. These are now being encouraged by the NPA Salvage Div. and will shortly be publicised.

It may be necessary to add the new type small vacuum cleaner to each machine used in dry grinding operations to collect the diamond bearing dust. Inexpensive sediment tanks in the coolant system will probably be needed where the operation is wet.

Such sludge and worn out wheel stubs can be shipped direct to diamond reclaimers or to the wheel manufacturer. These manufacturers would then have the material reclaimed.

Many firms have been stockpiling diamond wheels far in excess of their monthly requirements, because of fear of being unable to get them. Cases are reported where firms have as much as 12 months' supply on hand. Obviously, this scare-buying creates an artificial shortage. Steps should be taken to see that the inventory of diamond wheels is no more than is required for continuous operation on a reasonably current basis. Duplicate ordering and buying should be stopped.

One of the biggest and quickest savings can

result from using diamond wheels more wisely. For example, where mass removal of stock on carbide tools is required, with no consideration given to finish, silicon carbide or some other type of abrasive wheel should be used. This also applies to the grinding of all steel shanks, to which the carbide is brazed. This is highly practical if coolant is used.

TABLE II

### OFFHAND GRINDING COSTS Wheel binding materials compared

|                     |                   |
|---------------------|-------------------|
| Metal bond.....     | \$0.0137 per tool |
| Vitrified bond..... | 0.0223 per tool   |
| Resin bond.....     | 0.0630 per tool   |

It is estimated that about 30 pct of the diamond powder used in grinding carbides presently goes into off-hand grinding of carbide tools. Many tests have been made and it has been proved beyond a doubt that properly made metal-bonded or vitrified bonded diamond wheels will outlast resin-bonded wheels by a minimum of five times and in some cases ten times. Test grinding costs appear in Table II.

Obviously, if 7 million carats of crushing bort is imported annually, and 80 pct goes into grinding carbide tools, 5.6 million carats would be so used. If 30 pct of this is for off-hand grinding, 1.68 million carats would be used annually for this operation. With metal or vitrified bonded wheels, this figure might well be reduced to 300,000.

The widespread use of resin bonded wheels in such an operation is an outgrowth of our economy after World War II. During that period, workers on off-hand grinding machines found that by crowding a resin wheel a little and using pressure, they could grind a little faster. By grinding dry they need not get their hands wet.

Many such operations were being done. In dry grinding with resin-bonded wheels, there was less likelihood of damaging or cracking the tool from local spot heating than in dry grinding with vitrified or metal-bonded wheels. However, the pressure used would dig into the softer resin bond. And since the bond did not hold the diamond as firmly in place as metal or the vitrified bonding material, the diamonds would roll. In their rolling they would give a slightly faster rate of cut, but they would also be kicked out of their bond more quickly. At best they gave only 20 pct of the life they would have if held firmly in the bond.

At present, however, many of the larger firms are swinging to vitrified or metal-bonded wheels for such uses. They find that improvements in modern metal and vitrified bonded wheels, proper coolant and proper operator education result in little or no difference in speed of cutting. The increase in wheel life presents large economies.

It is estimated chip breaker grinding consumes 20 pct of the total diamond wheels used

### Diamond wheel shortage (continued)

for carbide tool grinding. Here, too, present day metal or vitrified bonded diamond wheels can save diamonds and money if used properly. Also, a new grinding technique is reported by one manufacturer. It is claimed that it will make any wheel last longer.

Aside from using the proper type of wheel for the job, it is recommended that all grinding of carbide tools, regardless of type, should be done under coolant if possible. This includes flood coolant, wick coolant or the new mist type of coolant attachment. Any of them is better than grinding dry. Special diamond wheel coolants are available which are much more efficient than water. However, water is better than dry grinding.

Not only is diamond wheel life longer when coolant is used, but there is less likelihood of cracking or checking the tool. Tests were made to determine the difference in costs between dry grinding and coolant grinding by wick and

TABLE III  
COMPARATIVE COSTS OF  
DRY AND WET GRINDING\*

|              |     |
|--------------|-----|
| Stream ..... | 100 |
| Wick .....   | 147 |
| Dry .....    | 350 |

\* "Stream" coolant costs, the lowest, are represented by the base figure of 100.

stream. It was found after a run of a specified number of pieces on each type that the costs were as shown in Table III.

Savings are effected when coolant is used regardless of whether the wheel used is resin, vitrified or metal bonded.

While it is recognized that in profile grinding the use of coolant is impractical, nevertheless, the other types do permit such coolant use. Coolant attachments as well as portable coolant pumps and tanks are readily available on the market.

In addition, certain other general rules will go far to save diamonds and money. These are described in the accompanying box.

Grinding at slower speeds can be a definite waste of diamonds and money.

#### Chattering spindle raises costs

All diamond wheels should run true within 0.001 in. and in special applications 0.0005 in. A chattering spindle is also a waste of diamonds and money. The cost of a diamond wheel alone easily pays for constant checking to be sure of proper wheel alignment and a true running spindle.

Repeated checking to be sure the user actually needs the diamond mesh specified is also necessary. The most critically short mesh is from 140 to 180, due to its large demand for carbide grinding. A coarser mesh, say 80 to 100, not only grinds faster, but the operator can, by relaxing all pressure towards the end of the

grind and permitting the tool to "spark out", often obtain a finish comparable to that of 140 to 180 mesh. The user can get delivery of an 80 to 100 mesh wheel much more quickly at present. For example, a specially developed wheel can often help.

Diamond wheelmakers are developing new techniques for grinding and their field engineers should be constantly consulted to see if some new method can save wheels.

Recently, many engineers have been investigating substitute methods for grinding hard metals. One of these is the electro-mechanical processes which have been used in Russia for several years. Examples of these are found in machines sold by the Elox Co., and Firth Sterling Steel & Carbide Corp's "Method X."\*

\* Judkins, M. F., and D. F. Dickey, "Electro-Mechanical Method X 'Machines' Carbides, Hard Alloys," THE IRON AGE, July 26, p. 45, Vol. 163, No. 4, 1951.

These methods use an electric spark smothered in a fluid. They have been very successful in extracting broken taps from holes being threaded, forming shaped cavities or holes in carbide dies and making carbide dies.

If such a substitute method is to be of real value for grinding carbide tools it must be one which can be employed quickly. It must be capable of grinding, relatively, as fast as our present diamond method. It must produce a satisfactory finish on the tool, one which is not injurious. No damage to the tool can result which would cause failure or shorter life. Preferably, it should not increase the cost of grinding.

One of the most promising of the new methods is one developed by George Keeleric, United Drill & Tool Co. It involves an electrolytic type of grinding which differs from the spark or arc methods mentioned above. Both the Elox and "Method X" techniques cause small particles of tungsten carbide to be mechanically dislodged from the main work piece. This occurs when the spark or arc is exploded between the work and an electrode. In the electrolytic method, stock removal is caused by a chemical decomposition of the material being ground.

Keeleric's method uses a metal-bonded diamond wheel in conjunction with electricity. None of these methods have yet been thoroughly tested as to the cost, practicability and efficiency of the tools so ground. An explanation of the electrolytic method will show why it holds the most promise for grinding carbide tools, particularly in off-hand grinding operations.

In the electrolytic method, existing grinding machines can be converted without too great cost. The diamond wheel is insulated from the rest of the machine by a fibre disc mounted between the wheel and the adaptor. Brushes are mounted behind the diamond wheel and baffled off to keep them dry during the operation.

The positive pole of a rectifier is connected

to the grounded table on which the tool rests. The negative pole is connected to the brushes in back of and in contact with the diamond wheel. As the wheel rotates, an electrolytic fluid floods the top of the tool, forming a sheet or film of fluid between the tool and the wheel.

The electric current used is up to 18 v, dc. The amperage created when the tool is in contact with the wheel runs up to around 80 amp, depending on the area of contact.

The tool is placed firmly on the table and the current is conducted from the table to tool, through the film of electrolytic fluid to the metal bond of the wheel and back to the rectifier.

The diamonds in the wheel perform two functions. They space the tool from the wheel. It has been found that when the tool is closer than 0.0007 in. to the wheel, an arc or spark occurs which is injurious to the wheel and to the tool. Diamonds protruding from the wheel should protrude just enough to give a clearance greater than the above mentioned 0.0007 in. This permits the electrolytic fluid to be swept between the tool and the matrix of the wheel.

As the operation proceeds, a film of tungsten oxide is formed on the face of the tool against the wheel. The diamonds continually wipe this film away, thus permitting constant electric or chemical action. The metal from the tool face against the wheel is rapidly dissolved and carried away in the form of tungsten oxide. This is evidenced by the fact that in the electrolytic fluid tungsten oxide is found instead of tungsten carbide.

#### Longer grinding life possible

At first it seems strange that diamonds, which are a form of highly purified carbon, are such good non-conductors, but they are. Such a wheel seems to work perfectly.

Without using pressure on the tool against the wheel, the speed of metal removal seems reasonably fast. Current investigation will evaluate this exactly in terms of actual comparisons with diamond grinding. According to the first manual test, it seems to be about as fast as diamond grinding.

In such an operation, it is hoped that lack of pressure against the diamonds will permit metal-bonded wheels to last many times longer than they do at present. When pressure is exerted against a diamond wheel used in the

new electrolytic method, a combination of electrolytic grinding and diamond grinding is obtained. The grinding is four times faster than when exerting no pressure. So the diamond wheel should grind four times as much carbide than as if no electric current were used. However, life tests have not yet been completed to substantiate this.

The electrolytic action works as well on a steel shank as on carbide without loading the wheel. Speed of grinding is such as to make preliminary grinding or relieving of the steel shank under the carbide unnecessary.

With regular diamond wheel grinding, the larger the area of contact of the carbide against the wheel face, the slower the grinding. In the electrolytic method, a larger area of contact does not affect the number of thousandths of inches of carbide removal per minute.

The finish obtained through this method is entirely different from the finish obtained with the present diamond grinding method. Samples have been produced ranging from 5 microinch finish to 14 microinch finish. This is well within

the range of satisfactory tolerances for carbide tool work.

No change in technique from that now used in conventional grinding is required—except that the operator may have to learn not to apply the type of manual pressure to which he has been accustomed. This is an advantage.

Electrolytic grinding is definitely a cool process and creates no heat of any kind. It is one of the coolest of all processes for machining carbides. It should never disturb the composition of the carbide or subject it to the minute cracks, fissures or checks which are possible with other methods.

It should be borne in mind that this method is still under investigation and research. Until field experience is actually obtained, the method cannot be recommended to industry. The life of both the diamond wheels used in this method and the tools so ground must be checked further. The tools must be tested in actual operations on the machines for which they are intended. This is the present situation, even though the method looks promising theoretically at this time.

No one measure of conservation will solve all the problems of diamond wheel usage for carbide grinding. All should be worked on constantly and continuously.





Don't give up the chips—

## SALVAGE PLAN

# reuses 78 pct of scrap carbide



By W. M. Halliday

Consultant  
Southport  
England

Weekly collections of all worn and broken carbide tools, including fragments of broken tools, provide the stockpile for this thorough salvage plan. Some can be reground and used again. Tips from the rest are added to the fragment stock. Fragments can be ground to tip small tools, or made into scribe tips, or inserted at wear points on fixtures, dies, and gages. Uses are found for 78 pct of all scrap carbide collected. Besides this direct saving, there are other benefits.

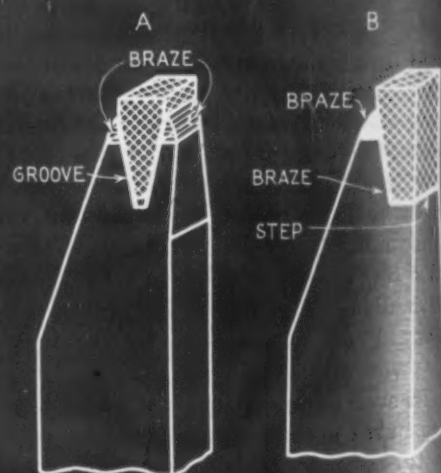
A carbide salvage program in a plant of one of England's largest electrical manufacturers has eliminated 78 pct of the direct loss of this valuable and currently scarce material. Secondary savings in terms of increasing working life of jigs, fixtures, and gages, more than compensate for the cost of the other 22 pct.

Worn tools and fragments of broken tools are reclaimed for reuse. They may be reused as cutting tools, or for use at wear points in fixtures, dies, and gages. By weight, 78 pct of all carbide tools broken or worn out in service are reused. It is estimated that 65 to 70 pct of the original cost of all carbide scrapped is thus recovered. Though few pieces are too small to be used somewhere in solid form, even those which are not otherwise useable can be used in crushed form to make abrasive compounds.

The plant manufactures electric motors, which involves machining of steel, cast iron, copper, and aluminum alloys. Production averages 800 to 1000 motors a week. Machining is done chiefly on automatic lathes, turret lathes, and chucking machines, all tooled with carbides.

A check prior to beginning the salvage program revealed large stocks of worn and broken carbide tools lying unused. It also showed that a surprising amount of carbide was being lost

FIG. 1—Two methods of applying tips on pin gages. Tips are made from salvaged carbide scraps. Groove is saw-cut  $\frac{1}{4}$ " deep across each tip.



in discarded fragments of broken tools. A rule was therefore made requiring collection and weekly delivery to the tool room of all worn and broken tools, and tool fragments. These are sorted weekly by the tool-room foreman. All carbide turned in is examined with three objectives in mind.

The first objective is reuse of tipped tools where possible. By regrinding or adaptation of rakes and cutting edge forms, many tools can be saved for further cutting use. It was found, for example, that about 34 pct of all broken tipped lathe tools could be reconditioned for use as light finishing tools. Those tools which cannot be reconditioned have their tips removed and added to the collected fragments, while the shanks are reconditioned for new tips.

Secondly, all loose fragments of carbide are sorted once a week to determine their suitability for other use. It is found that many pieces are large enough for reshaping into tips for small tools. All other fragments are resorted for other uses.

#### Check for cracks and flaws

The third objective kept in mind during inspection is checking all pieces for cracks or other flaws. This is done visually, with a magnifying glass. When doubts as to soundness exist, parts are heated to a dull red, in a small muffle furnace to prevent oxidation. Minute cracks then are more plainly revealed as dark lines, usually visible to the naked eye. Another test method consists of striking the fragment a sharp light blow with a brass hammer. This is sufficient to open up tiny flaws to where they can be seen under the glass.

Of course the major benefit from this program has been reclamation for use of carbide which would otherwise be wasted. It has been found that many damaged cutting tools can be reconditioned inexpensively, without removing the cutting tip. Many large size loose bits of carbide can be ground to be used as cutting tips. Other fragments can be employed on gages, drills, and fixtures.

The residue of carbide fragments considered useless for any of the above purposes are still not discarded. These are pulverized on a special anvil for use with oil or paraffine in abrasive grinding and lapping compounds. However the number of pieces useable only for this purpose is surprisingly small. And it has tended to decrease the longer reclamation program has been in effect, since more and more other uses are constantly being found.

#### Large use in tipping gages

One of the most successful uses for fragments other than as cutting tool tips has been in tipping gages. Hundreds of pin-and-gap gages are in use in this plant. Most are made from non-shrinking case-hardening steel with the gage points tapered to give domed tips about  $\frac{1}{8}$  in. in diam. It was a rule that all gages be returned to the tool-room at least once a week for checking. These checks showed that a considerable amount of wear occurred on the tips due to mishandling, improper hardening, and forcing. Continuous corrective maintenance work on gages was thus required. High cost prevented use of a superior grade of steel.

The following procedure was worked out for tipping these gages with carbide scraps: Tips

FIG. 2—How scrap carbide bits can be applied to wear points on snap gages to increase accurate life 10 times. Gages will last to 6 mon. without appreciable wear.

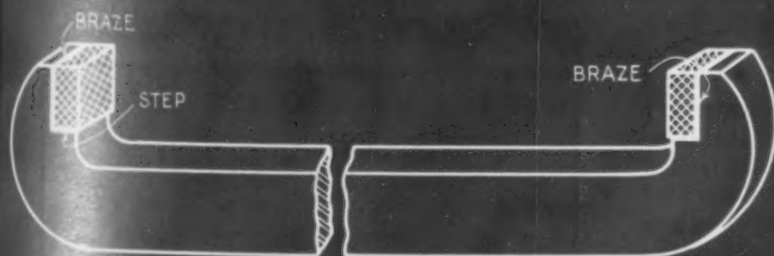
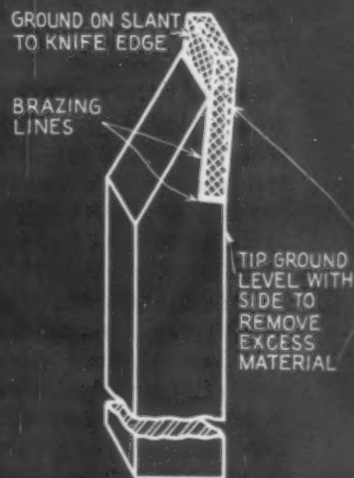


FIG. 3—Small carbide fragments can be applied as shown to make long-lasting tips on scriber blades.



### Carbide salvage plan (continued)

are shortened about  $\frac{1}{8}$  in. and their hardness drawn back. A groove is saw-cut across each tip, as shown in Fig. 1, about  $\frac{1}{4}$  in. deep. The gage sides are pressed slightly apart to give a tapered opening.

Pieces of carbide of roughly  $\frac{1}{8} \times \frac{1}{8}$  in. cross-section and from  $\frac{1}{4}$  to  $\frac{3}{8}$  in. long are used. These are not accurately finished prior to installation, other than being made reasonably square on one end. The opposite end is ground slightly tapered to suit the slot. The tip is brazed in place and air cooled. Then surplus brazing material is snag ground away to expose part of the tip.

At B in Fig. 1 is illustrated an alternate method. Here the side of the gage is stepped down to about half thickness for about  $\frac{1}{4}$  in. The carbide fragment to be used must have one flat side to match.

### Tool grinder completes job

Tips are completed by finish grinding in an ordinary carbide tool grinding machine.

Snap gages are treated in a similar manner, as shown in Fig. 2. A shallow step, about  $1/16$  in. deep, is filed on each end. Fragments selected for tips are about  $\frac{1}{8}$  in. thick, and one face is ground flat to match the step. Brazing and finish grinding to size completes them.

Experience over a year shows these tipped gages can go as long as six months without appreciable wear, while most untipped gages had to be corrected five or six times in six months. The average wear in a year on tipped gages is about 0.00025 in., against average error due to wear of 0.0028 in. on untipped gages.

A considerable portion of very small fragments has been found useful for tipping small special boring tools, threading bits, drills, and other tools. Many of these require tips smaller than the lowest stock size available from carbide producers. Before the practice of utilizing scrap carbide was adopted, such cutters were made from high speed steel. Now they can be made from less expensive steel and yet have longer life due to the carbide tips.

### Brazing fixtures stocked

Many flat drills, facing cutters, and form tools formerly made of tool steel are now made of inexpensive steel and tipped with carbide fragments. A large stock of simple grinding and brazing fixtures has been built up to facilitate this work.

The smallest bits of scrap carbide are utilized in tipping scribing tools. Fine splinters and needle-like pieces, otherwise useless, are satisfactory for this purpose. The scriber tip is filed square and slotted with a saw cut about  $1/16$  in. wide and  $\frac{1}{8}$  in. deep. One side of the tip is ground thin to enable clamping the tip in the slot. A suitable small bit of carbide is then brazed in place and ground to a point.

The scriber blades on vernier height gages, normally cast alloy, are also being tipped with scrap carbide. Very thin, flat, pieces are used, and brazed to steps filed on the existing blade. The base of the step is slightly inclined as shown in Fig. 3, so the extreme end will lie slightly below the bottom edge of the blade. In grinding, after brazing, sufficient stock is ground off the overhanging portion of the tip to bring it level with the base of the blade. Then the slant side is ground to produce a razor edge.

### Use carbide at fixture wear points

Though reamers are now available with carbide tips, the shop had a large number of split two-blade adjustable sizing reamers of high speed steel still in use when the carbide reclamation program began. These have been tipped with carbide scraps. A suitable seating is ground in the end of each blade, to receive a carbide piece which is fairly thick and close to regular rectangular shape, brazed in place.

Another valuable use for fragments of carbide has been on jigs and fixtures. These have to have suitable location pads, steps, and abutments on which or against which the workpiece fits to line it up correctly. Since these surfaces must be hard and durable it is natural to think of making them of carbide.

All supporting pads, location steps, jig feet, and similar points have now been carbide-tipped. In some cases quite large pieces of carbide were required, but generally small pieces could be used, especially where a number of bearing points could be selected.

This proved especially valuable on drill jigs, where cast iron pieces are located over bosses or pins on the jig. It was found that the accumulation of abrasive dust from cutting caused rapid wear which soon made the pins undersize, giving eccentric location to the work.

This has been overcome by machining a number of shallow seatings into the pins or bosses, each one adapted to receive a careful chosen piece of carbide. These are brazed in place so they project over the diameter of the pins, and then are ground to correct diameter.

The cost of collecting, sorting, and mounting carbides has not proved excessive. No special equipment or skill is required. Cost of the program has been more than compensated not only by the value of the reclaimed carbide which would otherwise have been wasted, but by reduced wear and greater accuracy where carbide tipping has replaced less-durable metals.

ASTE ANNUAL MEETING AND  
INDUSTRIAL EXPOSITION

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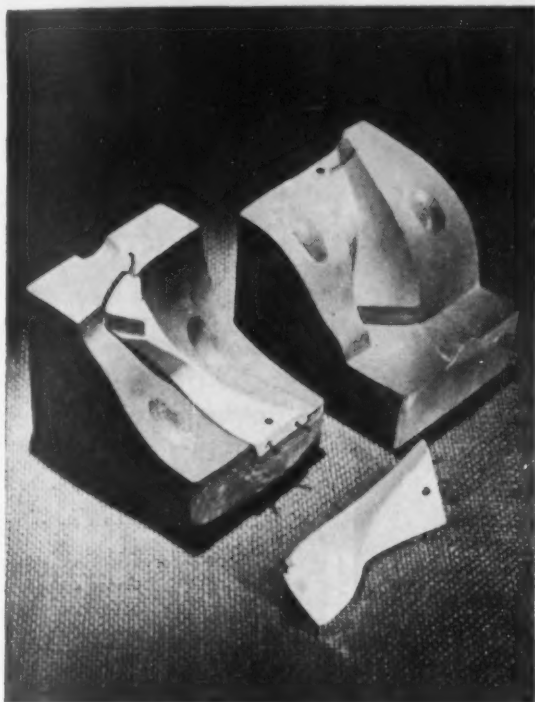


## Plastic molds give more impeller blade cores

Higher output and lower costs in production of cores for impeller blade assemblies have been possible through use of plaster molds at Airesearch Mfg. Co. of Los Angeles. The thermosetting liquid phenolic resin, Tool-Plastic, used in the molds was supplied by Resolin, Inc.

Maximum number of parts obtainable from stone molds previously used was about 1500. Airesearch has produced over 20,000 cores to tolerances of 0.005 in. using plastic molds, with no dimensional changes in the parts. As yet no sign of wear is evident in the molds.

Cores produced with stone molds cost 16¢



SET OF PLASTIC molds have been used to pour more than 20,000 impeller cores at Airesearch. Cores are held to 0.005 in. Plastic is lighter, more easily handled.



MOLDS MADE from thermosetting liquid phenolic resin have smoother surface finish, and far outlast stone molds.

each compared with a cost of 1¢ each for cores from plastic molds.

The plastic material is lighter and more easily handled. If necessary it can be readily reworked. The frequently required replacement of a set of stone molds called for 1½ days of work by skilled tool personnel.

The smoother surface finish of plastic permits another time-saving production advantage. Sterene, the medium of separation used in the casting process, must be reapplied to stone molds after each cast. Plastic molds yield three or more cores before regreasing is necessary.

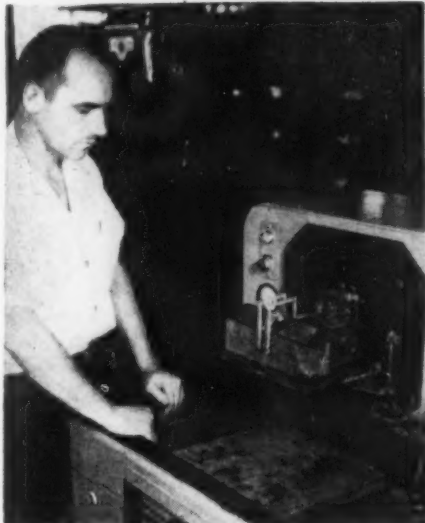
## NEW BOOKS

*"The Patent Right in the National Economy of the United States,"* by Gustav Drews. Dr. Drews, in a thorough analysis and appraisal has clearly outlined the position of the patent right and invention in our industrial society. The book is highly documented, but maintains fluid readability, and can well serve management in attaining a deeper and more realistic understanding of the value of patents and inventions. The book originally was published in serial form in the Journal of the Patent Office Society. Central Book Co., 261 Broadway, New York. \$5.00. 211 p.

*"Basic Blueprint Reading and Sketching,"* by Olivo and Payne. This book provides instruction material for those who must develop the ability to read and interpret blueprints and make shop sketches. It serves the needs of both beginners and those who need refresher training. Delmar Publishers, Inc., 650 Albany 1, N. Y. \$2.25. 162 p.

*"The Science of Precision Instruments."* This book for industry and schools contains one of the most comprehensive descriptions of the practice of dimensional quality control ever written. The DoAll Co., 254 North Laurel Ave., Des Plaines, Ill. \$3.50. 246 p.

# Tool Engineer's Notebook



(See Cut Above)

## JOB

Salvage expensive high speed lathe tools.

## PROBLEM

Lathe tools, 8 in. long, cost \$17 each, yet only four inches of each tool can be used before it must be scrapped.

## SOLUTION

With induction heater, 4-in. stubs are brazed to 4-in. shanks so entire amount of original tool length can be used.

## RESULTS

The method saves \$2000 per month, paying for the induction heating machine in less than two months.  
Data from Ohio Crankshaft Co., Cleveland

## JOB

Production of fire extinguisher pressure cartridges.

## PROBLEM

Reduce production costs.

## SOLUTION

Using ram-type turret lathe, machine and assemble cartridge in one chucking. End of cartridge is turned, bored, faced, threaded, and tapped, on lathe. The hex collar is placed around cartridge neck and fastened with grooving and rolling operation, without stopping spindle.

## RESULTS

Need for separate welding operation to attach collar is eliminated. Time required for work done is cut one-third.

Data from Gisholt Machine Co., Madison, Wis.

## JOB

Turning cast iron corn husking machine rolls.

## PROBLEM

Interrupted cutting caused by numerous grooves on the long, slender roll. Severe vibration due to interrupted cut, despite use of roller steady rest, so bad that cross slide feed handle has to be fastened with C-clamp to prevent creepage. High speed steel tools require regrinding after turning only three rolls.

## SOLUTION

Utilize tungsten carbide tool.

## RESULTS

Tools turn 350 rolls before regrinding is necessary, equivalent to 115 times greater tool life.

Data from Kennametal, Inc., Latrobe, Pa.



(See Cut Above)

## JOB

Completely turn forged fork.

## PROBLEM

Reduce cost of machining fork, which is SAE 4130, heat treated to about 300 Bhn.

## SOLUTION

Utilize tracer-controlled lathe.

## RESULTS

Machining time cut 90 pct. Job formerly required three operations on three different machines. Total machining time: 50 min. Total setup time: 3 hr. Now job is completed in single setup. Machining time: 5 min. Setup time: 20 min. In addition, tool change time reduced.

Data from Monarch Machine Tool Co., Sidney, Ohio



(See Cut Above)

## JOB

Assembly of 6-part magnetic switch.

## PROBLEM

Three operators with mechanical press assemble only 212 switches per hour after deducting scrap.

## SOLUTION

Use press operating on pressure-reversal principle: ram automatically reverses when preset pressure is attained. This reduces breakage due to thickness variations in plastic component of assembly.

## RESULTS

Same three operators now produce 370 units per hour, with scrap losses cut 83 pct. Need for chasing internal threads, formerly damaged by press previously used, eliminated.

Data from Denison Engineering Co., Columbus, O.

## JOB

Lubricate 51 taps on special Snyder machine which taps 40 auto engine blocks per hour.

## PROBLEM

High production work on cast iron cylinders hard on taps. Tap breakage high on machines previously used.

## SOLUTION

Snyder machine equipped with Oil Fog lubrication for its 51 taps.

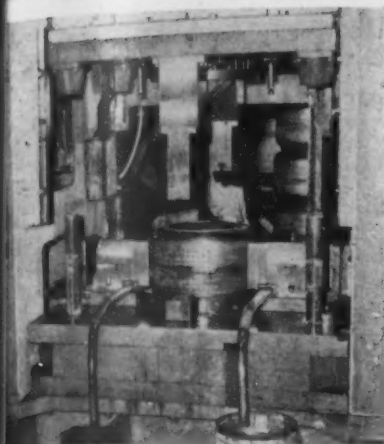
## RESULTS

Oiled air not only lubricates taps, but cleans and cools them. Tap breakage reduced, and better hole produced.

Data from C. A. Morgan Co., Denver



# Practical ideas for the tool engineer, showing through actual case histories how others have solved typical shop problems.



(See Cut Above)

## JOB

Punch 1035 holes  $\frac{3}{8}$  in. in diam. in automatic washer spin drier tub.

## PROBLEM

Holes punched from outside leave burrs inside which harm clothes. Extra operation to remove burrs expensive.

## SOLUTION

Automatic cam-acting piercing die in 350-ton mechanical press used. Press arranged for 6-stroke cycle. Tooling mechanically linked to movement of press slide for indexing.

## RESULTS

Equipment punches holes from inside out. No burrs on inside of tub. All 1035 holes punched in one handling and one press operation. Production 60 per hr.

Data from Versen Allsteel Press Co., Chicago

## JOB

Finish bore welded stainless steel cylinder, 51 in. OD, 16.5 ft long.

## PROBLEM

Tool life on this rugged job unsatisfactory.

## SOLUTION

Utilize Kennametal Grade KM carbide, operating at 6 rpm and 0.015 in.-feed.

## RESULTS

Entire bore completed in 35 hr without tool change, representing about 30 miles of lineal cutting without a tool change. Tool was restored with ordinary regrinding. Bore had only 0.009-in. taper over 16.5-ft length.

Data from Kennametal, Inc., Latrobe, Pa.

## JOB

Obtain strength in front wheel spindle.

## PROBLEM

Heat treat to hardness of 302 to 340 Bhn gives needed strength, but makes part hard to machine. Surface speed must be low and tool life is poor.

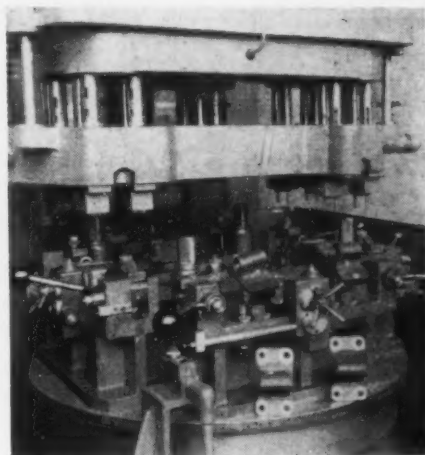
## SOLUTION

Burnish at two points of greatest stress: fillets at steps on spindle. A. P. Schraner double-ended machine, with two burnishing wheels at each end, used.

## RESULTS

Needed strength retained but hardness specifications lowered to 255 to 302 Bhn. Machining time shortened and tool life increased by expenditure of only 15 extra seconds to burnish each spindle.

Data from Ford Motor Co., Detroit



(See Cut Above)

## JOB

Drill and ream four  $\frac{1}{2}$ -in. holes, and spotface holes  $1\frac{1}{4}$  in. diam.

## PROBLEM

Material tough to machine, yet high production required.

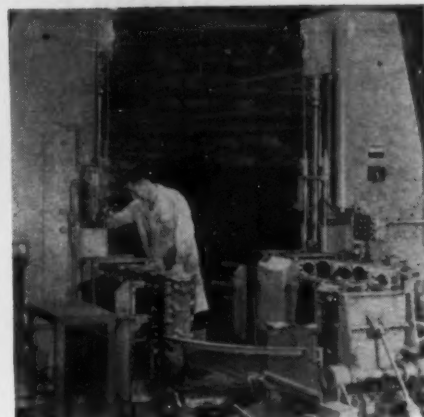
## SOLUTION

Special multiple drill head designed, with emphasis on strength, rigidity, and heavy duty bearing construction.

## RESULTS

Machine has been producing parts for two years with no major breakdown.

Data from Buhr Machine Tool Co., Ann Arbor, Mich.



(See Cut Above)

## JOB

Finishing main bearings in automotive cylinder blocks.

## PROBLEM

To generate size, alignment, geometry, and finish in tandem bores, productively.

## SOLUTION

Honing bearings with Micromatic machines, equipped with automatic control and guided tools.

## RESULTS

60 blocks honed per hr, removing approximately 0.002 in. stock from diameter. Diametric size and alignment held to less than 0.0005 in. variation, gauged by a single mandrel, multiple orifice, air gauge. Surface finish held consistently to the required 40-microinches rms.

Data from Micromatic Hone Corp., Detroit

## JOB

Machining small castings for air conditioning equipment.

## PROBLEM

Hardened steel chuck jaws required recutting, on the average, every seven or eight days. After a few regrinds, jaws had to be replaced. Chucked end of workpiece had draft angle of 8° which caused frequent slippage when chuck jaws wore.

## SOLUTION

Steel jaws tipped with carbide.

## RESULTS

A single set of jaws can be used three or four months before regrinding is required, about 13 times longer life. Scrap is reduced.

Data from Kennametal, Inc., Latrobe, Pa.

Turn to page 278



Delivery in weeks, not months—

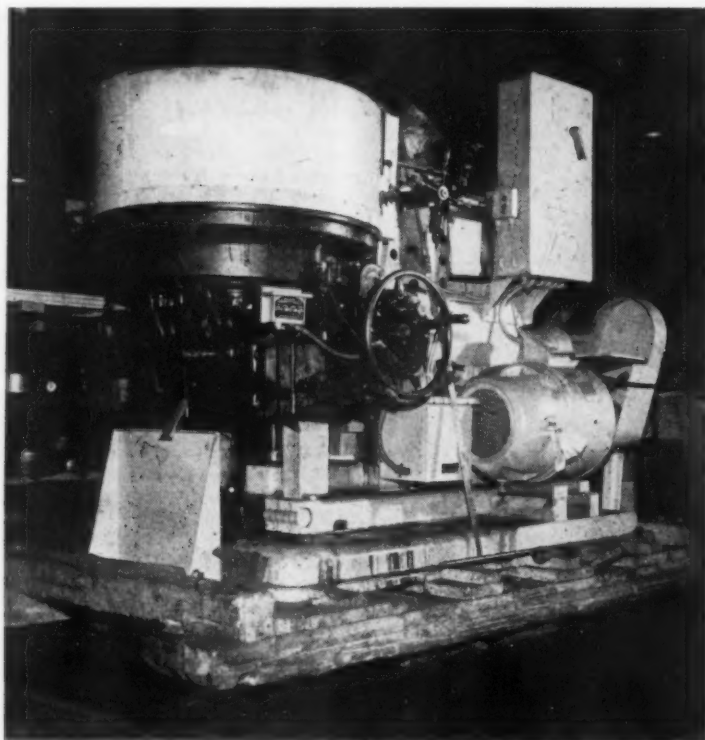
## REBUILT MACHINES

## speed defense tooling



By W. G. Patton  
Asst. Technical Editor

Vital machine tools for defense production are being reclaimed at the rate of 5 a month in Ford's Rouge tool and die shop. Rebuilding program for used tools has 14 steps. Included are rescraping ways, new wiring, replacing broken or missing parts. Some machines are remodeled for special work. Rebuilding takes a matter of weeks, while delivery on equivalent new machines would require months.



ARTER grinder, as received from World War II storage, thickly coated with protective grease. Spare parts boxes, motor, and control, are still attached. On many of the machines they are missing and must be replaced.

Vital machines for national defense are being reclaimed from used machinery stocks in the world's largest tool and die facilities at the Rouge plant of Ford Motor Co. Since last June a steady flow of machine tools, otherwise useless, have been repaired and in some cases rebuilt to new standards. Work is done both for Ford's own prime defense contracts as well as under subcontract for an aircraft firm.

Tools arrive from such warehouses as Marietta, Ga., South Charleston, W. Va., Mechanicsburg, Pa., and Scotia, N. Y. Most are machines which have been stockpiled since the last war. They are coated with rust-proof compounds, some are encased in plastic cocoons, most have parts and wiring missing. Ford's job is to put them back in A-1 running order as quickly as possible. This Ford does with time savings averaging 6 to 10 months over the delivery time of equivalent new machines.

Included in the wide range of machines handled are Bullards, Healds, Bryants, Monarchs, Americans, Reed-Prentice, Lodge & Shipley and others. Some machines are rebuilt directly for Ford's Chicago defense plant.

Recently, a special lathe was delivered to Ford for rebuilding. After removing plastic coating and grease, the machine was rebuilt and ready for shipment in only three weeks. Even with top priority short of actual diversion, de-

livery on a new machine of the same type would take about 15 months. Rouge tool and die makers recently put back into operation a Cincinnati Hydro-tel milling machine which would have required many extra months for delivery new. These are examples of the value of this rebuilding program.

Ford's reconditioning and rebuilding activity follows a 12-step program. First step, taken as soon as the model and make of a machine to be rebuilt is known, is to assemble all possible catalogs and other data on parts and accessories. Then, also as soon as possible, an inspection and inventory of the machine is made. Frequently, electric controls, motors, special tooling, and similar parts, are missing. The purchasing department is put to work immediately on missing parts.

### **Cleaning is next step**

Second step is thorough cleaning and inspection of the machine. The third step is to decide, on the basis of inspection, to approve or reject the machine for rebuilding. Experience has shown that some of the machines received cannot be reconditioned to meet the required standards. They are so obsolete, so worn, or so badly damaged, as to be considered not worth the effort and expense of rebuilding.

Third, a work order is issued for tearing down and detailed inspection of the machine. The fifth step consists of issuing a work order for rebuilding after the machine has been disassembled and thoroughly inspected.

Step six consists of assigning reconditioning work to the machining construction department. The superintendent of this department assigns the job to a bench leader who follows and supervises the operation. Included in the operations are regrinding and rescraping all ways, required on almost all machines. Replacement of spindles and bearings is frequently necessary. Broken cast parts are ordered from the original manufacturers when possible and when delivery time is not too long. Otherwise, Ford makes the part, usually replacing castings with weldments. In fact, any part which cannot be purchased in a reasonable time is made, instead, by Ford's tool and die men.

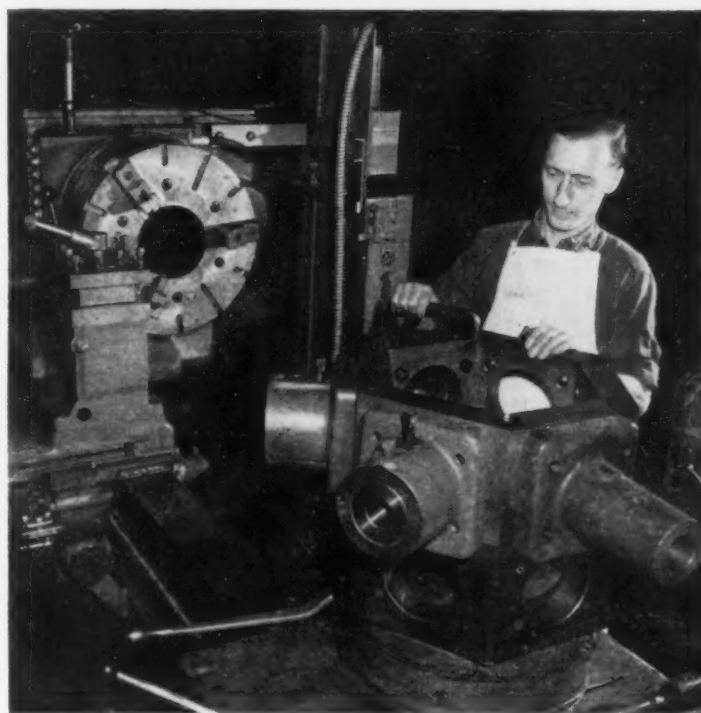
### **Electrical wiring replaced**

The seventh step is to replace all electrical wiring. Experience has shown that so little of a machine's wiring is liable to be good that time is saved by replacing it all. Over half the machines received have electric motors which need replacing or at least rewinding. Often the motor may test out all right and operate satisfactorily at first. But an extended running test will show that insulation has deteriorated so that short circuits soon appear.

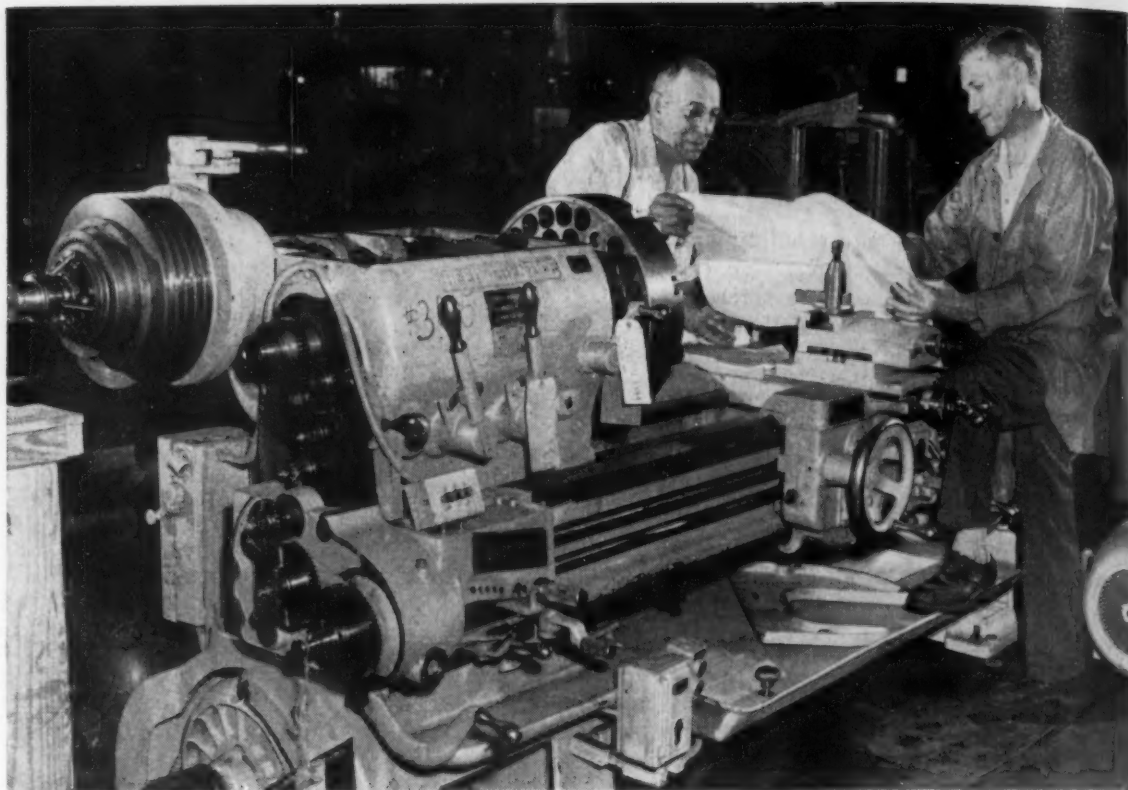
The eighth step consists of thorough repair of hydraulic systems, where the machine has them, and repacking of all pumps and other



SCRAPING of ways is one of the operations which must be performed on nearly all the machines received. Usually, too, all electrical wiring must be replaced. More than half the machines need new motors or motor rewinding.



GISHOLT lathes like this were rebuilt to provide 40-in. swing, to handle work which otherwise would have meant using vertical turret lathes. Riser blocks were added at headstock, square turret, and hexagon turret.



REBUILDING is planned by Ford engineers after machine has been cleaned and inspected. Manufacturer's drawings, catalogs, and all other possible data is utilized. Parts which can't be delivered by maker are made by Ford.

#### Rebuilding machine tools (continued)

equipment. Step nine is reassembly of the machine.

The tenth step consists of a thorough operating test. The motor is carefully checked even if previous tests did not indicate necessity for replacement or rewinding. And, of course, flatness, runout, vibration, and all other factors affecting accuracy and performance are checked. Next, the machine is repainted using standard machine tool paint.

The final step is shipment. In the case of machines rebuilt for Pratt & Whitney shipment is made to the firm itself or to a subcontractor which it designates. Since Ford is one of Pratt & Whitney's subcontractors, some of the machines are assigned to its own plants.

It is not unusual for the program on some machines to include more than the rebuilding outlined above. Some machines are redesigned more or less extensively to fit them for work other than that for which they were originally built.

One such case involves a number of Gisholt 4R turret lathes with 31-in. swing. These are being rebuilt to provide a 40-in. swing. The work includes raising the turrets 8 in. and designing and installing new sheaves. The horsepower of the lathes is also being increased in this conversion. As rebuilt, these machines can be used on a specific job which normally would have required a type of vertical turret lathe which today is in extremely short supply.

Another example of rebuilding ingenuity involves several standard lathes which were needed for high precision work. The runout on these lathes is normally 0.0005 to 0.0007 in. The work required no more than 0.0003 in. runout. But delivery time on new precision bearings for these machines would be high. On investigation, Ford found bearings of suitable precision, in a less popular size, available for immediate delivery. The lathe spindles were then reground to fit the available bearings. The machines went into service months ahead of the time otherwise possible.

In a related program Ford is making up special drill jigs which enable doing work on radial drills which otherwise would require scarce boring machines.

Floor space at the Rouge tool and die plant is at a premium these days. It has been necessary, therefore, to plan, schedule, and follow up the machine tool rebuilding program with the same type of controls employed for other defense tooling projects being done in the same plant. Rebuilding of machine tools is definitely not a stepchild in this plant's operations.

Machine tool reconditioning work at Ford is being completed at an average rate of 4 or 5 machines a month. The saving in delivery time for rebuilt machines over new machines to do the same work averages six months and may run 10 to 20 months or higher. In addition, taxpayers are being saved as much as 75 pct of the cost of new machines.



# PRECISE TOOLING MATERIALS HANDLING

## dovetailed in automatic crankshaft balancing machine



By E. C. Beaudet  
Cleveland Editor

All counterweights and checks on the V-8 crankshaft are machined. The usual unbalance of 20 oz-in. in each end of the V-8 crank has been reduced to 0.25 oz-in. by DeSoto using an automatic balancing machine built by Gisholt Machine Co. Loading, weighing, drilling and unloading and transfer cycles are all automatic. Four machines and eight operators turn out 160 completely balanced and inspected shafts per hour.

One of the outstanding pieces of automatic equipment installed at De Soto's recently opened plant at Detroit, Michigan, is an automatic crankshaft balancing machine, Fig. 1, developed by the Gisholt Machine Co., Madison, Wisconsin. The equipment takes an unbalanced V-8 crankshaft to a finally balance state including inspection. Although currently balancing and inspecting crankshafts at the rate of 40 per hr, the machine is actually capable of turning them out at a rate of 55 per hr.

A V-8 crankshaft differs from the conventional American six-throw crankshaft in that on the six throw the unbalance is primarily determined by the forged or unmachined portions of the crank while the V-8 has very few unmachined surfaces and the unbalance is mainly determined by machining operations prior to balancing. All the counterweights and cheeks on a V-8 shaft are machined on the faces and their outside diameter, Fig. 2.

Unbalance corrections on a V-8 shaft can be made at very few points and these are generally limited to the counterweight portions of each cheek, with the result there are limited angular sections on each end of the shaft in which corrections for balance may be made and in which

the machining operations must cause the unbalance to fall. To make sure the unbalance falls in these areas a lot of unbalance is deliberately introduced in that general direction so that machining tolerances won't throw the unbalance out of the desired areas. Because of this, unbalance in excess of 20 oz-in. in each end of a V-8 crankshaft is not uncommon whereas on a conventional six-throw shaft it generally runs in the neighborhood of 12 to 15 oz-in. per end.

To bring an unbalance in excess of 20 oz-in. down to 0.25 oz-in. which is required by De Soto is rather difficult in a single drilling operation at high production rates.

In production, drills tend to get dull and not cut to size even though the depth of drilling is controlled. Variations in the size of the drilled holes can make the unbalance correction vary considerably.

The Gisholt balancing equipment takes a crankshaft with an unbalance in excess of 20 oz-in. and reduces it to meet requirements of less than 0.25 oz-in., although it can go to less than 0.15 oz-in. in two correction drilling operations.

In balancing a V-8 crankshaft it is necessary

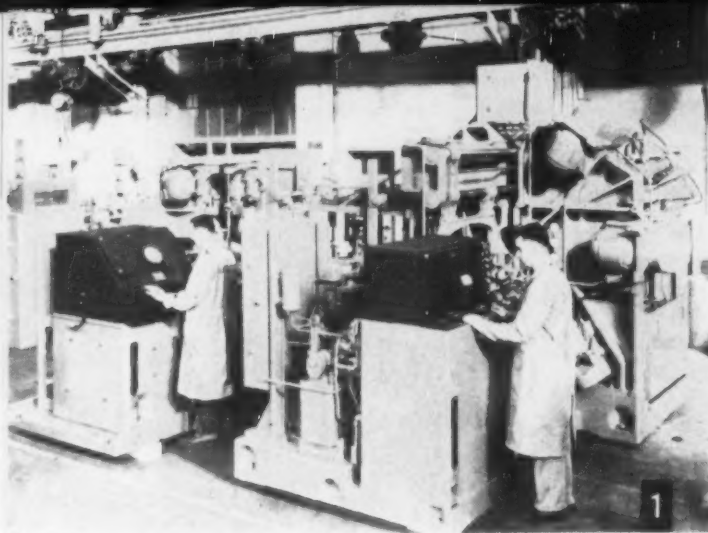


FIG. 1—"... automatic equipment installed at DeSoto ..."

#### Automatic crankshaft balancing machine (continued)

to put on each crankpin a ringweight or bobweight which gives the same centrifugal effect as the pistons and rods on the ultimate engine. The size of these weights is determined by the designer of the engine from the mass effects of the pistons and rods.

The first part of the balancing package consists of an unbalance measuring machine electrically tied in with a correction drilling ma-

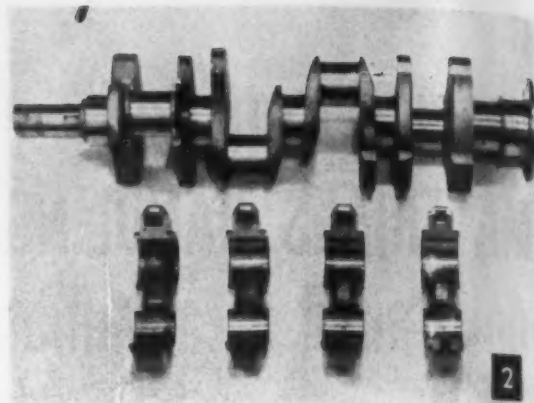


FIG. 2—"All the counterweights and checks are machined ..."

chine. In order to be able to make a large correction, the first operation permits the drilling of three holes spaced  $60^\circ$  apart on each of the large counterweights at the ends of the crankshaft. The correction drilling machine carries six drill spindles so arranged as to drill into these counterweights at the six points where it is permissible. The unbalance measuring machine has six unbalance weighing dials which, when each are turned in sequence to bring the amount of unbalance meter to zero, actually

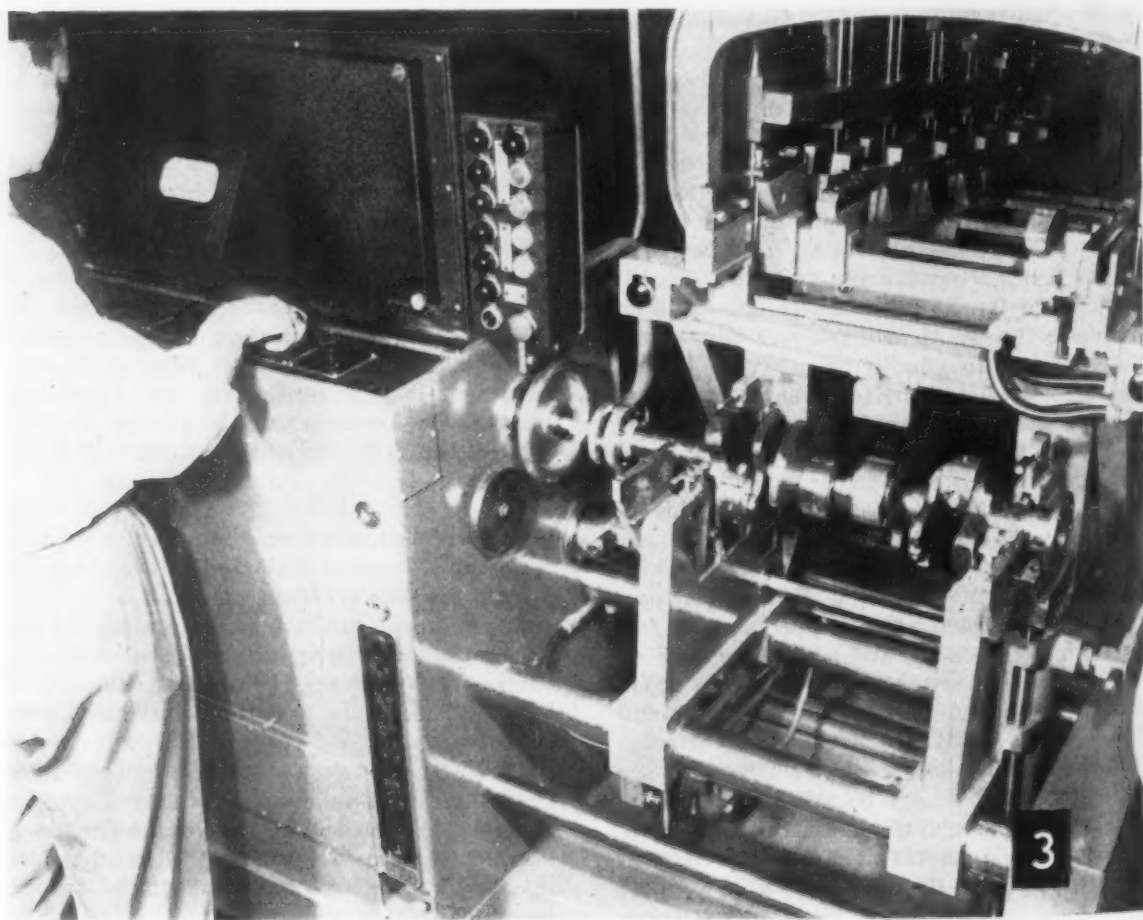


FIG. 3—"... a crankshaft is inserted into the unbalance measuring machine and started in rotation."

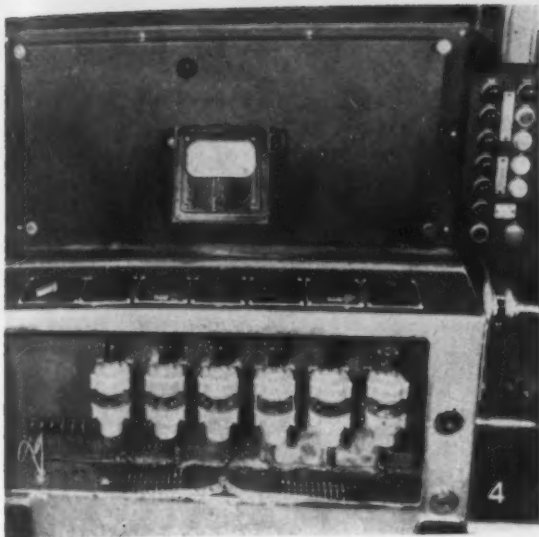


FIG. 4—"... the rotor of a selsyn transmitter ... sends a signal to a corresponding drill spindle."

establish depths to which a corresponding drill will drill a hole in the shaft.

At the beginning of the operation a crankshaft is inserted into the unbalance measuring machine, Fig. 3, and started in rotation. The

FIG. 5—"A hydraulic lifting device raises the crank to the level of the correction driller ..."

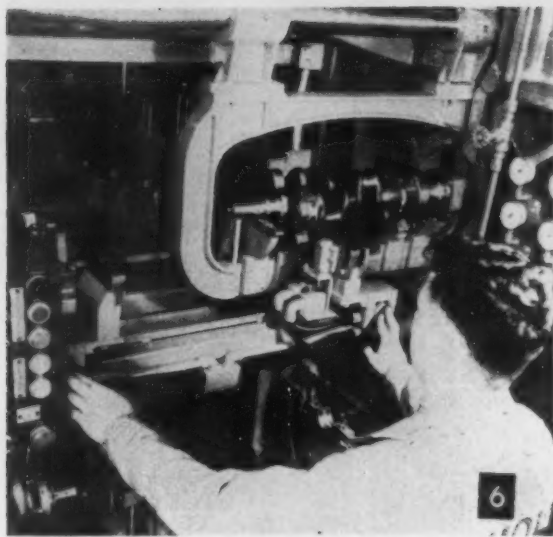
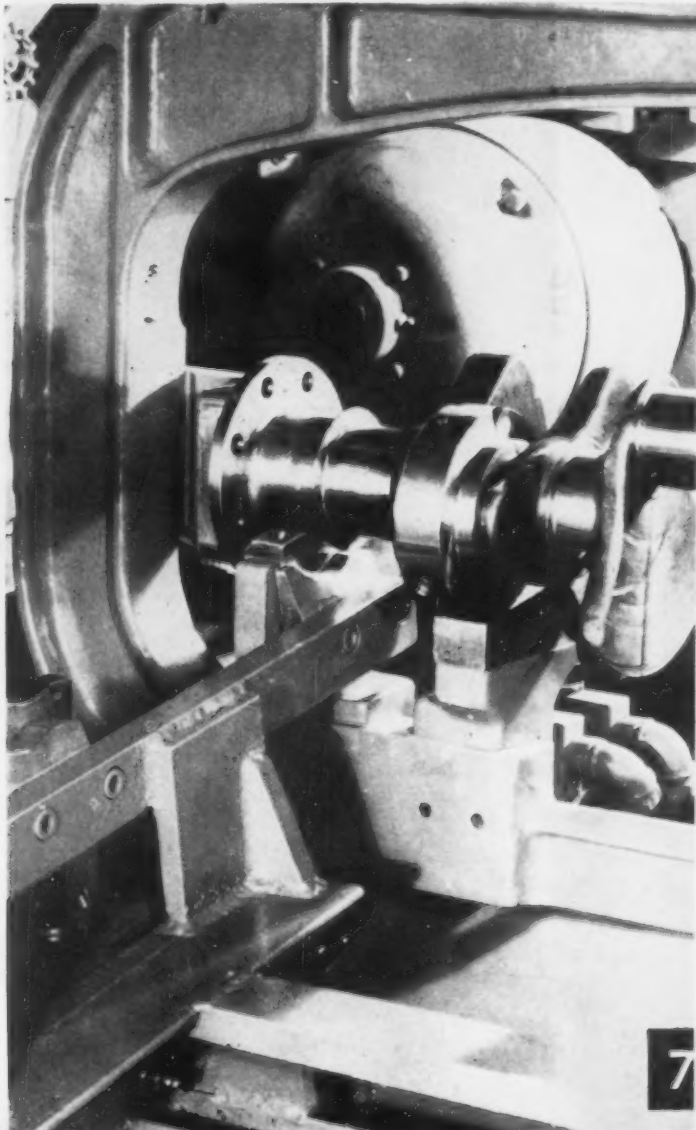


FIG. 6—"The shuttle enters the drilling machine ..."

six weighing dials corresponding to the six correction drilling positions in the counterweights of the shaft are designated A, AB and B for one end of the shaft and D, CD and D for the other end. The dials, Fig. 4, are turned in

FIG. 7—"After the drilling cycle is completed the shuttle carries the crank out ..."





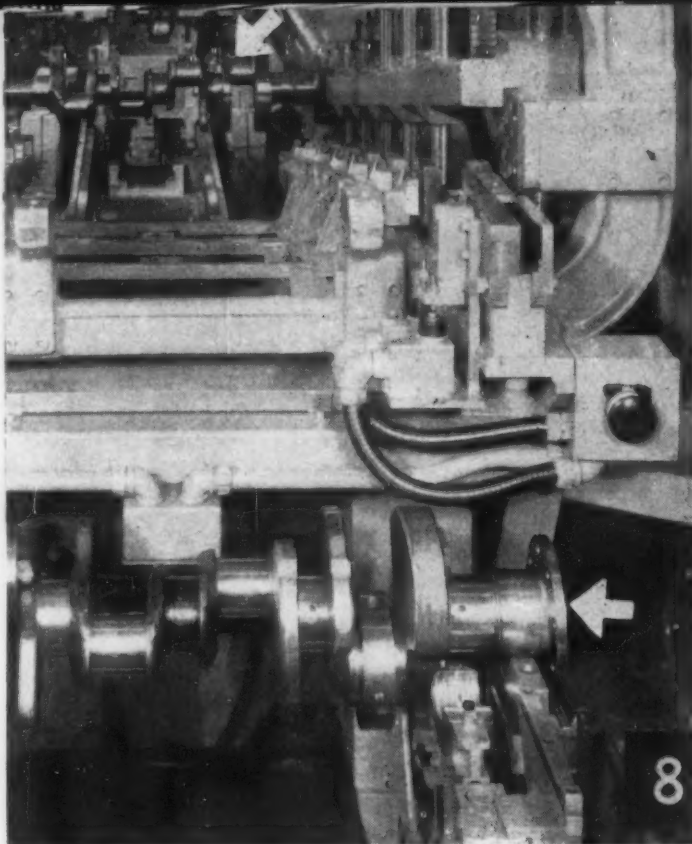


FIG. 8—"... the unloader which carries it down by stages to the second balancing machine."

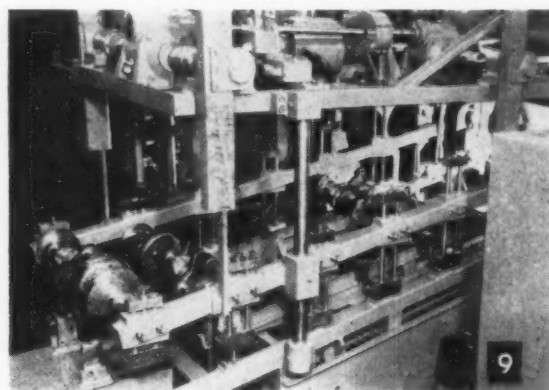
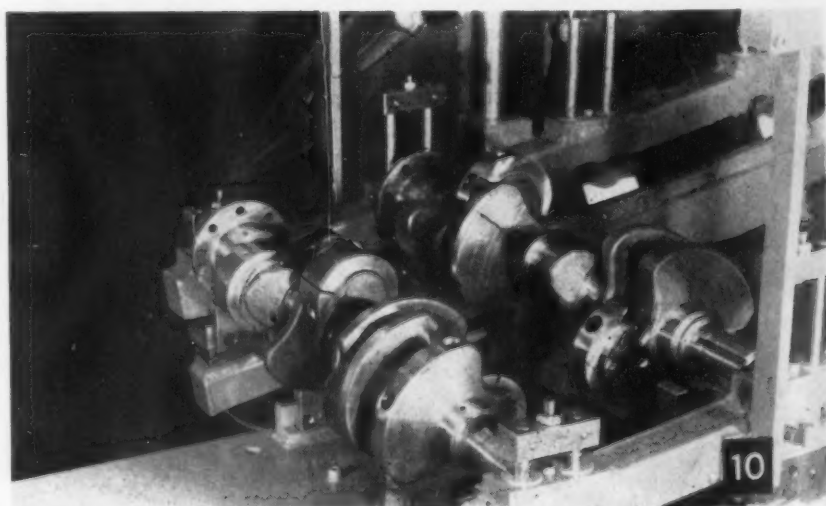


FIG. 9—"The unloader serves as a storehouse . . ."

FIG. 10—"This carriage takes the crank to a position on in the final balancing machine."



#### Automatic crankshaft balancing machine (continued)

sequence to bring the amount of unbalance meter reading to zero. In turning the weighing dials to zero the amount of meter, the rotor of a selsyn transmitter is turned a like amount and sends a signal to a corresponding drill spindle. A selsyn receiver on the drill spindle actuates a cam which controls the depth of hole to be drilled by the spindle. Thus, the drill spindles are set for the depth of the correction drilling.

The balancing machine is then stopped and the crank drive is uncoupled by the operator. A hydraulic lifting device, Fig. 5, raises the crank to the level of the correction driller where it is pushed onto a driller shuttle. When in the driller shuttle the operator pushes two drill buttons simultaneously to initiate the correction drilling cycle and the shuttle enters the drilling machine, Fig. 6, where the correction operation is performed.

Three seconds after the drilling operation starts, the operator can begin balancing another crankshaft without disturbing the depth settings of the drill spindles. This is due to the fact that when the drilling cycle starts, a depth gage is pushed against the selsyn cam. The gage is taken away from the cam and the gage is clamped onto the drill spindle and this becomes the final depth trip for the drill. The cam can once more be turned without destroying this setting.

After the drilling cycle is completed the shuttle carries the shaft out of the driller, Fig. 7, to its position prior to entry. The shaft is taken off the shuttle by an automatic mechanism called the unloader which carries it down by stages to the second balancing operation, Fig. 8.

The unloader is one of the most unique features of the Automatic Crankshaft Balancing Machine. The inner portion of the unloader has a rectangular motion, moving forward, up, back and down. It enables a shaft to be taken from

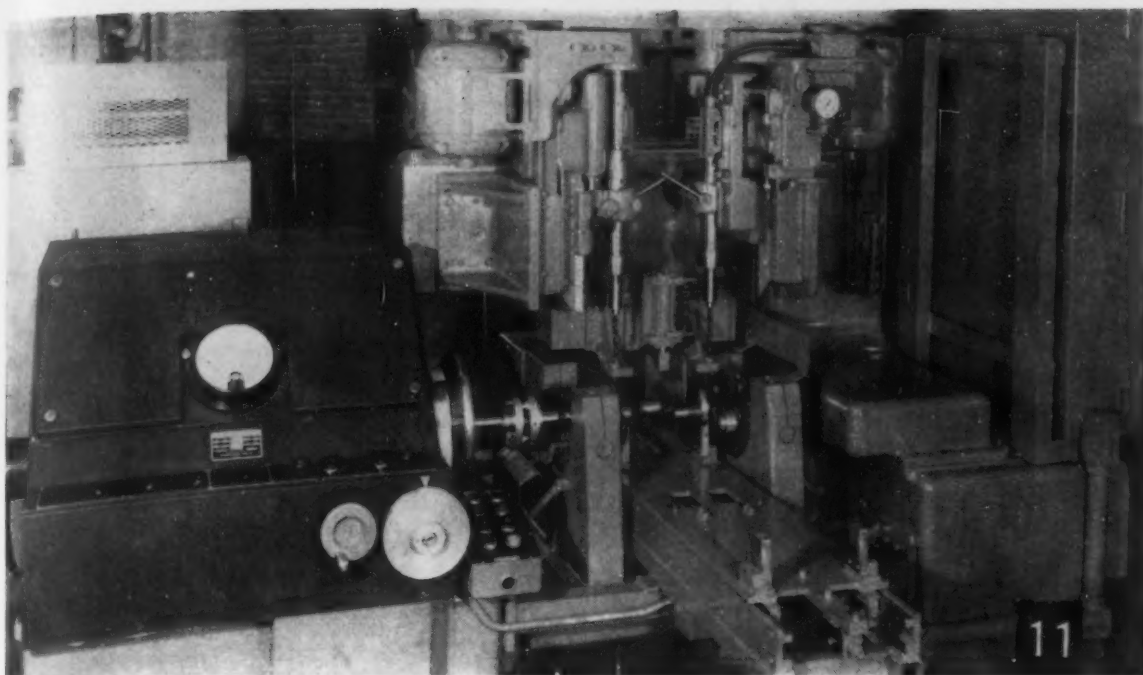


FIG. 11—" . . . into position for unbalance measurement . . ."

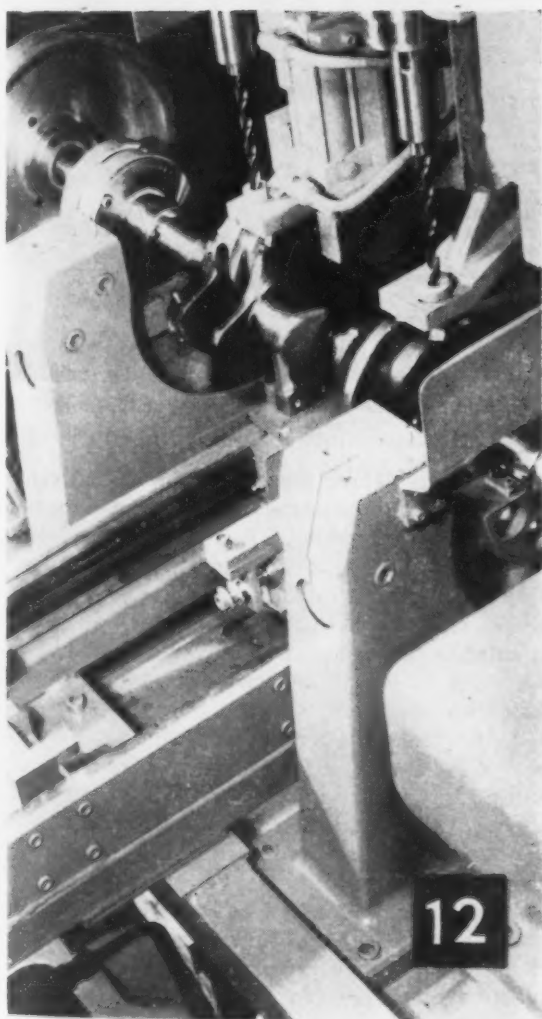


FIG. 12—" . . . which automatically causes the drills to operate . . ."

the shuttle associated with the drilling machine and pass it on in turn to each of seven stationary supports along the line until it reaches the last and seventh position.

When a shaft reaches the seventh station, it hits a limit switch which raises the seven stationary supports enough so that another shaft cannot be passed to the filled position. The same process is repeated when shafts fill up the other positions. The unloader, Fig. 9, thus serves as a storehouse as well as transfer mechanism. This enables the second operator to be kept busy even though the first machine would be down for a short period of time to change drills or for other reasons.

The crankshafts in the unloader are available to the hydraulically operated carriage of the second balancing machine. This carriage, Fig. 10, takes the crank to a position in the final balancing machine where the remaining unbalance may be measured and corrected to a fine order of accuracy.

Although the preliminary balancing equipment is capable of measuring unbalance to the desired accuracy, a small unbalance is deliberately left in this operation to take care of correction drilling errors which are largely due to improper drill maintenance under production conditions. This unbalance is purposely caused to fall in the narrow counterweights at each end of the shaft so that corrections for balance can conveniently be made by drilling into these counterweights.

The shaft is transferred from the unloader by a carriage which takes the shaft into position for unbalance measurement in a standard U-Type Gisholt balancer, Fig. 11. This same carriage, at the same time, removes a previously

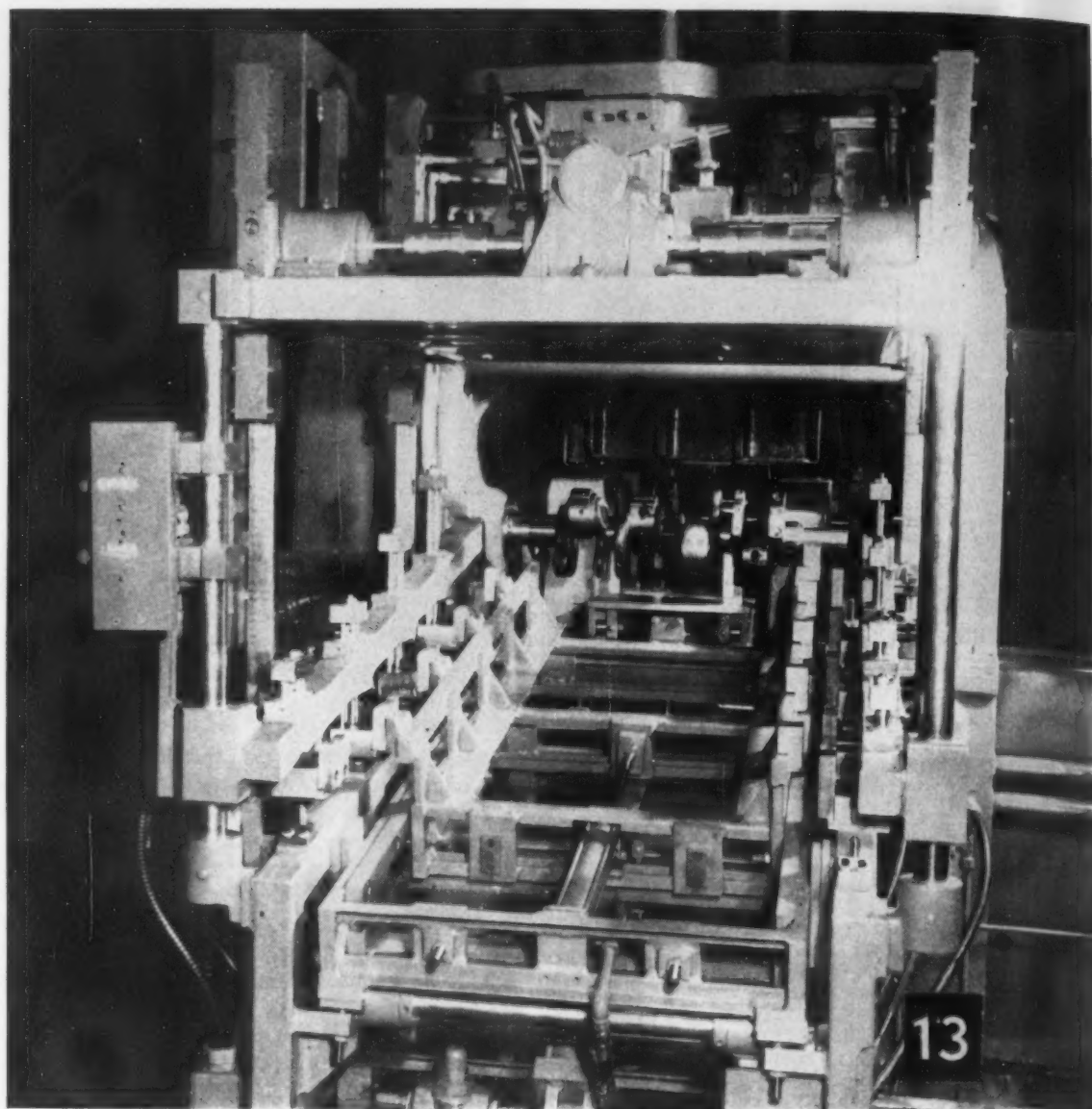


FIG. 13—"When it reaches the last station of the unloader . . . and is passed on to a superfinishing operation."

#### Automatic crankshaft balancing machine (continued)

balanced crank to the rear of this machine. As soon as the shaft is in balancing position, the balancing machine supports rise to support the crankshaft and lift the crankshaft free of the conveyor and the conveyor then returns to its starting position.

The shaft is coupled to the final balancing machine, rotated and the amount and angular location of correction needed on each end counterweight is determined. The operator then stops rotations of the crank, manually turns it to the angular position recorded for the left end and pushes a drill start button which automatically causes the drill to operate and retract once the proper correction depth has been reached, Fig. 12, which was established by a weighing dial which was set when the amount of unbalance was determined. The same procedure is then followed for the right end counterweight.

After the corrections are applied, the shaft is rotated and inspected for balance. When it has passed inspection, the operator uncouples the shaft and the hydraulically operated carriage transfers it to the second unloader which works on the same principle as the first. When it reaches the last station on the unloader, Fig. 13, it is taken off and passed on to a superfinishing operation.

Aside from the greater accuracy achieved, one of the further advantages of this balancing equipment is to be found in its labor saving. In a post war installation at another automobile plant, Gisholt installed equipment to produce 150 balanced crankshafts per hour which required 15 men. It consisted of four Two-Element unbalance measuring and correction machines requiring eight operators plus seven more inspection machines requiring one man per machine. This latest equipment can turn out 160 balanced and inspected crankshafts per hour using four machines and eight operators.



# Induction heater cuts tool costs

By Elroy Fellwock

Tool Maintenance Dept.  
Allis-Chalmers Mfg. Co.  
Milwaukee

Induction-heater brazing in repair of tools saved Allis-Chalmers over \$4000 in a recent 3-week period. Repair time for tools 1½-in. square is only 9 min. Cost for typical tool is only 50¢, with labor and overhead, over cost of new carbide blank.

**W**orn out or broken carbide tools can be repaired with electronic induction heaters at 55 to 75 percent below the cost of replacing damaged tools with new ones. High-frequency heating of this nature is applicable in a plant where carbide tools are used in volume. It is equally applicable in a small machine shop, where the induction heater can be applied profitably to tool repair in addition to various other metal heating and treating applications.

A 3-week survey by the Allis-Chalmers tool maintenance and repair department listed 821 tools of various sizes that had been restored to service with induction brazing. Repair costs were less than half that of new tool replacement. Cost computations include materials, time, labor, power consumption, and heater amortization, maintenance and tube replacement. Because carbide tools are a major production factor, Allis-Chalmers uses a 20-kw heater of its own make solely for tool repair.

According to the survey, replacement of tools by purchase for the 3-week period would have



CUTTING TOOL being repaired at Allis-Chalmers through use of induction heater. Cost is half that of new tool.

Repair Time for Various Sized Tools

| Tool Size, Sq in. | Repair Time | Brazing Time |
|-------------------|-------------|--------------|
| 1½                | 9 min       | 60 sec       |
| 1¼                | 7 min       | 45 sec       |
| 1                 | 4½ min      | 25 sec       |
| ¾                 | 4 min       | 15 sec       |

cost the company \$6529.95. Repairing tools by high-frequency heating cost only \$2027.20, including 100 pct overhead.

For example, a 1½-in. square tool would cost \$7.95 new. The tool was repaired in 9 min. This time preparation for brazing, including the cleaning of cavity into which the carbide blank was to be brazed, cleaning, grinding scale from surfaces of carbide blank, fluxing the tool, cleaning and applying silver solder, and brazing. The cost was \$2.34; \$1.84 for the carbide blank, and 50¢ for brazing, including 100 pct overhead. This cost includes sand blasting.

Total repair time on various sized tools is shown in the table.

Total carbide tool repair time can be further reduced by systematic repair according to size. Because volume handling of one size tools simplifies preparation of tools prior to brazing, 3 min were saved in the total repair time for the 1½-in. and 1¼-in. square tools, while 2 min, approximately 50 pct, were saved in handling the smaller tools. The new tool costs do not include downtime and consequent delays resulting from time lost in the purchase of the tools.

Although used primarily for brazing tool tips, about 5 pct of heater time is spent for other metal heating and treating operations relative tool repair and maintenance. Most of the coils used for tool repair are made by A-C's repair department. Others are made by the company's electronics section. Coil designs are available for each size tool handled so as to place the coil as close to the work as possible for maximum heating efficiency and economy. About 30 sec is required to change coils.

Why not turn it faster?

## HIGH SPEED MACHINING - A Primer



By George Elwers  
Machinery Editor

**T**here's no magic in high velocity machining. Running at surface speeds two or three times normal requires no fancy gadgets, no freak tool designs, no special equipment. All that is required is strict attention to sound tooling rules which everyone should follow anyway.

Several years of continuous research at Jones & Lamson Machine Co. have shown there is no reason why parts machined in the past at 250 to 300 sfpm can't be turned at 500 to 600 sfpm. On many of the jobs J&L estimates at 500 to 600 sfpm, it is found after setting up the machine that speed can be increased to 900 or 1000 sfpm. Jones & Lamson believes that between 500 and 600 sfpm is a good place to start, followed by increasing speeds as much as possible within machine capacity and horsepower.

Naturally the machine tool used must have the necessary spindle speeds available. Rigidity is imperative. Running at extra high speeds is like shining a spotlight down a dark alley. Defects which didn't show before suddenly stand out clearly. Deflections in machine parts which don't affect accuracy or surface finish at conventional speeds will show up at high speeds. Many engineers who have abandoned high velocity trials in disgust are probably not successful because they're not using machine tools that can stand the gaff.

Here's how to turn at surface speeds two or three times normal. You don't need special machines or special tools. Jones & Lamson, which has been doing it for years, says the secret is to carefully apply good sound tooling principles which are known to everyone but not always rigidly adhered to. Plenty of coolant; a rigid machine, tool, and workpiece; exact tool angles, well-finished tools—these are basic principles of high speed machining.

An important corollary to machine rigidity is workpiece rigidity. The piece itself must be stiff enough, and it must be properly mounted and supported to withstand the strain of high velocity machining.

Correct tool design is important, but involves nothing unusual. One exception is that usually more than the normal amount of rake is found desirable. The usual 4 or 5° of rake doesn't seem enough. With this exception, standard practice for the work being done is followed with respect to tool angles. It is important that the required angles be very accurately ground. Sloppy or inaccurate grinding can't be tolerated.

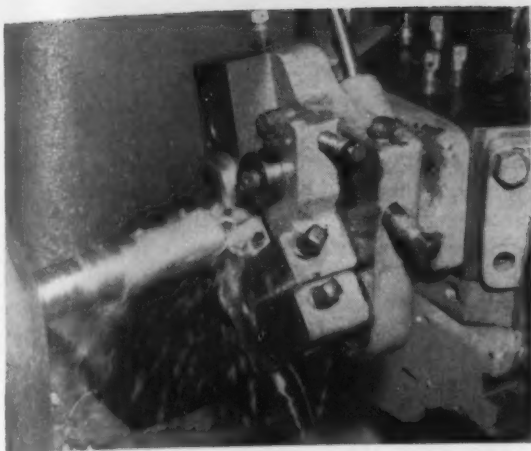
Carbide tools, of course, are used. Jones & Lamson finds mechanically held tips preferable to brazed tips. The tool holder and tool shank must be extremely rigid, and must hold the tool absolutely rigid. A fine finish on the tool is essential.

A plentiful supply of coolant is required on almost all jobs. The main reason for increasing rake angle, in fact, is to get more coolant at the cutting edge. Coolant can't be carelessly applied, but must be directed carefully and follow the cut. One case where coolant is not desirable is where intermittent cuts are taken at high cutting speeds. Here the coolant quickly shatters

WHAT OTHERS ARE DOING

| Part              | Material            | Maximum Speed, sfpm* | Feed, ipr |
|-------------------|---------------------|----------------------|-----------|
| Camshaft.....     | Cast Iron           | 342                  | 0.014     |
| Sun Gear.....     | Steel Forging       | 423                  | 0.011     |
| Gear.....         | Steel Forging       | 415                  | 0.014     |
| Gear Shaft.....   | Steel Forging       | 882                  | 0.018     |
| Pinion Shaft..... | Steel Forging       | 959                  | 0.016     |
| Pinion.....       | Steel Forging       | 1200                 | 0.015     |
| Bearing Race..... | 52100 Steel Forging | 670                  | 0.024     |
| (turning)         |                     |                      |           |
| Bearing Race..... | 52100 Steel Forging | 945                  | 0.006     |
| (forming)         |                     |                      |           |
| Bolt.....         | 1045                | 740                  | 0.015     |

\* Ordinary speeds range from 250 to 300 sfpm.



**HIGH SPEED MACHINING** in action. This is a large stainless steel bolt. Spindle speed for all operations, including threading, is 2000 rpm. Maximum surface speed is 714 sfpm. A turret lathe is used.

the cutting edge due to repeated quenching of the carbide.

Feeds must not be too low. Low feed is liable to cause chatter and crowding or rubbing of the carbide on the work.

Chipbreakers which are satisfactory at conventional surface speeds won't necessarily be good enough at high speeds. An effective chipbreaker is essential, however. The right design for a given job may have to be determined by experiment.

Tool life at high velocity, if these principles are followed, will generally be as good or better than at conventional surface speeds. Life may drop as speed is increased above normal up to a point, then it rises again and often exceeds conventional speed tool life.

One now-famous J&L job is an automotive gear pinion forging, made of SAE 8620 steel. The job was estimated at 600 sfpm. When it was set up and actual cuts were taken, it was found this speed was too low. The material was welding to the cutting tools. Speed was increased to 900 sfpm on the outside diameter of the bevel gear, and results were satisfactory.

#### Forging turned at 1200 sfpm

After tests at this speed were conducted, speed was increased to 1000 sfpm. This was satisfactory, and so was the increase to 1200 sfpm which is the speed at which the job is now run. Tool life is good at these speeds. White chips are produced. The workpiece and tool are cool.

Cutting time is 8.5 sec and floor-to-floor time only 17 sec. Life on the insert-type tools used is as high as 1000 pieces per indexing.

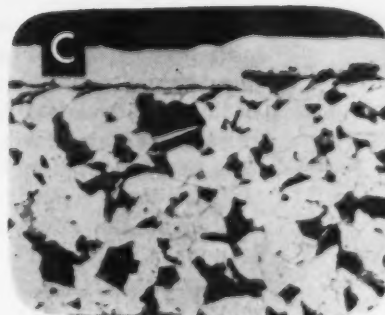
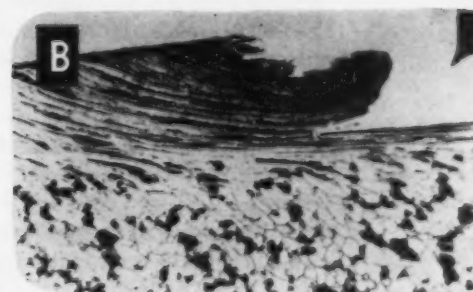
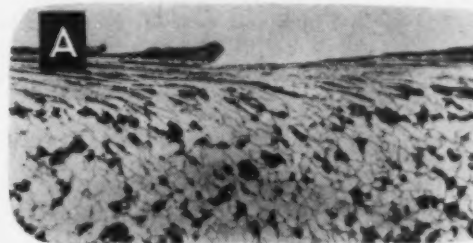
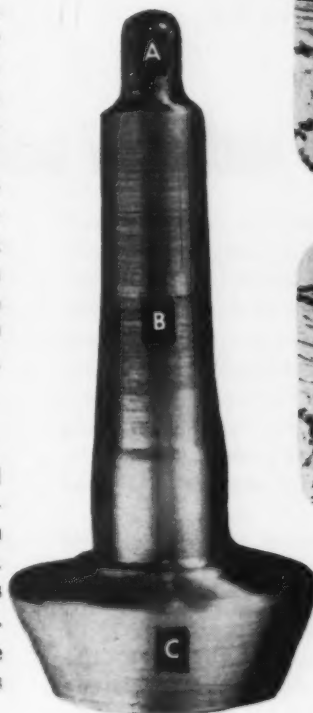
It was found in increasing speed from 900 to 1200 sfpm, which is a 33⅓ pct increase, horsepower requirements only increased about 10 pct. More significantly, diameter control was excellent. Regardless of original runout on the forg-

ing variations in structure density and hardness, size did not vary from one piece to the other. All that was found was a slight continuous size growth due to tool wear.

Naturally when deciding whether to go to high velocity on a given job, the economics must be considered. High velocity saves machining time, and also frequently improves surface finish. In addition, when material is machined at high surface speeds there seems to be less distortion below the surface. This means less stress set up in the part due to machining, so less trouble with distortion later, especially in heat treating.

However, other factors must be weighed against these advantages. It costs more, usually, to set up work for high velocity machining. This extra cost appears mostly in the additional labor cost in taking greater care in tool design, tool grinding, setup, and machine operation. Such cost may not be justified if the savings in machining time are small in relation to cycle time. For example, with a total cycle time of 3 min.,

**HIGHER SPEED** in machining reduces distortion of metal structure under the surface. On this gear forging, the spindle speed was 300 rpm. Top micro shows surface where speed was 62 sfpm. Distortion below chip is much less in middle section, 112 sfpm. At bottom, where speed was 300 sfpm, there is practically no distortion. This job is now being run with carbide tools at 1200 sfpm maximum.



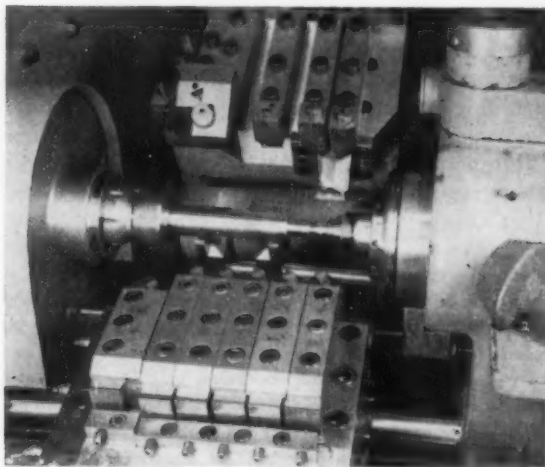


### High speed machining (continued)

there is little advantage in reducing machining time from 60 to 30 sec.

On the other hand, time savings on many jobs may be very substantial. In Jones & Lamson's own shop, for example, machining time on a cam drum turning job has been cut from 1 hr to 15 min, obviously a worthwhile saving.

Machining diesel engine bolts on a turret lathe offers another example. On this job, which has been done in SAE 1040 steel, SAE 8749 steel, and 303 stainless steel, surface speed is 714



AUTOMATIC LATHE tooled up for the same gear forging. Tools and toolholders are massive, for rigidity. Coolant is supplied in large quantity through holes in the tool blocks. Part of rough forging shows at right.

sfpm maximum, cutting time is 54 sec, and floor-to-floor time is 72 sec. On this job thread chasing is done at 2000 rpm, a surface speed of 390 sfpm. This offers an example of why tools need good finish. Chaser tip life before resharpener was needed was originally 250 pieces. Super-finishing the tips brought the life up to 700 pieces.

Many other examples can be cited. Sun gear forgings are roughed at 423 and finished at 400 sfpm. A gear shaft is roughed at 852 sfpm. On a pinion shaft, production of 80 pieces per hr. is obtained by turning at 959 sfpm. These are examples of what any shop can do with a little care, good rigid equipment, and with education.

J&L finds most machine operators can't be expected to double speed and step up to high level turning without seeing material cut at these speeds and feeds. They have to set up a new set of standards and establish a new yardstick for measuring turning values. When an operator has been running a job for years at 250 to 300 sfpm, he has to be shown. It insults his intelligence to tell him that he has been all wrong and that he should be doing the same job at double the speed.

Industry will never reach higher levels in turning speeds without carrying on an educational program for their machine operators and mechanics. It requires an educational program on tool grinding, so that rake angles, clearance angles and chip breakers will be ground uniform from one tool to the next. It requires education of shop supervision, methods, shop management, and, last but not least, top management.

## Standard surfinish blocks now available

**C**limaxing a 7-yr. co-operative research project, General Motors and Chrysler will soon make available to U. S. industry a set of Precision Reference Specimens of Surface Roughness. The new master blocks are made of pure gold and are accurate to a millionth of an inch.

Success of the surface finish research program will make available standards of surface finish measurement that are comparable to the famous Johansson blocks for dimensional measurement standards.

The joint project to develop uniform surface roughness specimens was started in 1945 as a joint project by Chrysler and General Motors. In addition to GM and Chrysler, University of Michigan physicists have contributed to the project. The standards defining the specimens have been adopted by both SAE and the American Standards Assn.

Prior to the development of the new "Gold Standards," there has been no standard for measuring surface finish. Each company developed its own standards. Because of varia-

tions in surface roughness, it was often found impossible to match parts from different shops in a precision assembly.

Reproduction of the master surface finish specimens by the F. A. Ringler Co. will make it possible for the one-man shop, as well as a large factory, to calibrate a surface measuring device by the same standards as the engineer who worked out the original specifications.

The new standard blocks will be made by F. A. Ringler Co., which contributed an electroplating process that has made possible production of accurate replicas of the gold master specimen standards developed by Chrysler and General Motors.

The first replica blocks to be produced will be a combination of five roughness values—the five most commonly used for machined surfaces. Suggested applications for the new surface finish blocks include close fits of automotive crankshaft journals and connecting rod bearings and other precision fits.

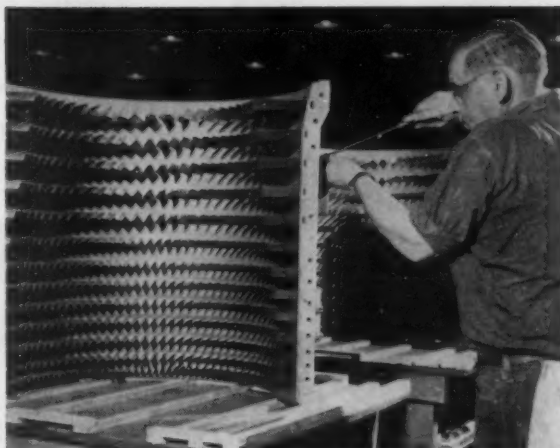
## Rolled sections replace forged jet blades

Fabricated blades will replace forged blades in the compressor stator of the J-47 turbojet engine. Airfoil section of the blades is cut from strip rolled to contour, attached to separately-formed bases by welding. Materials savings: 39 pct. Cost savings: 55 pct.

**A**ir Force approval has been given a General Electric Co. method of fabricating jet engine compressor blades. Blades are cut from rolled sections, welded to separate bases. The new method will save critical materials, reducing waste an estimated 39 pct primarily due to chipless production. It will also help relieve the present bottleneck in precision forging facilities. And it makes possible cost reductions of about 55 pct.

At present the method will be used only for stationary compressor stator blades. Forged blades will continue to be used on the compressor rotor and at the hot end of the jet. The average jet engine uses about 1000 stationary blades in the compressor stator section. Blades are made of stainless steel.

The new method has been in limited production at General Electric's Thompson Laboratory since late 1950 (THE IRON AGE, Nov. 23, 1950, p. 11). Approval of use of fabricated blades in the J-47 came this year. General Electric will make details of the rolling fabricating process available to other jet engine makers through the Air Force. Fabrication in this manner is only one of the substitutes for forged blades now



COMPRESSOR stator contains more than 1000 blades.

being investigated. Some jets use precision cast compressor stator blades.

Almost all blades for production engines are at present, however, forged. Under hammers, the all-foil section of the blade and the base or root section are formed from a single piece of steel. This is a slow, expensive process and forging capacity is limited by the millions of blades needed. Forged blades have bases dovetailed to fit in blade rings, which then are fitted in slots in the compressor casing.

Rolling of blades has been common in the manufacture of steam turbines. Blades are rolled in long strips, cut to length, and base sections are cast on. But jet requirements are stricter. The heart of General Electric's development is a method of making a separate base for the blades. This base has an opening so that the airfoil section can be inserted and welded in place. The base is shaped so it fills the same area as the present blade ring, eliminating the ring and its associated assembly process.

Fabricated blades will be used in the jet which is going into large-scale production for powering the B-47 Stratojet medium bomber. J-47 compressors have about 2000 blades, of which more than half are on the stator. The high centrifugal forces acting on rotor blades so far prevent fabricated blades being used there.

Design of the base of the fabricated blades is such that even greater resistance against vibration will be offered than by forged blades. Also, the new blade is more strongly fastened to the compressor casing, which will minimize the damage if a foreign body enters the compressor.

Performance tests run on two engines equipped with fabricated blades show they meet endurance standards, and have the same or slightly higher efficiency than forged blades.



FABRICATED BLADE, left, has rolled section welded to separate base. Forged blade is at right.

# NEW TOOL STEELS AND CARBIDES

Constant advancement in tool engineering and in product materials continually imposes new, tougher demands on tool materials. New developments in tool steels and carbides keep pace. Here is a list of the newest tool materials—specifications of more than 400 tool steels, die steels, and carbides introduced since 1949.



## A

### A. C. X.

A super tungsten high speed steel containing Co 11.00. Atlas Steels, Ltd.

### A. W. Special

A water-hardening, C-Cr tool steel. Contains C 1.00, Cr 1.40, V 0.20. Firth Sterling Steel & Carbide Corp.

### Achorn C. V. M.

Air hardening grade containing C 0.95 to 1.05, Mn 0.60 to 0.80, Si 0.10 to 0.30, Cr 5.00 to 5.50, V 0.20 to 0.30, Mo 1.00 to 1.30. Achorn Steel Co.

### Achorn 512

A mold steel containing C 0.08 to 0.12, Mn 0.40 to 0.55, Cr 1.40 to 1.65, Ni 3.25 to 3.75. Achorn Steel Co.

### Achorn M-2

A high speed steel containing C 0.80 to 0.85, Mn 0.20 to 0.35, Mo 4.75 to 5.25, W 6.00 to 6.75, V 1.75 to 2.10, Cr 3.90 to 4.40. Achorn Steel Co.

### Achorn V. B. C.

Oil hardening steel. Contains C 0.50 Mn 0.25, Cr 0.90, W 1.25, Mo 0.20. Achorn Steel Co.

### Air Hardening No. 30

A hot work die steel. Contains C 0.30, Cr 3.50, W 9.00, V 0.25. Republic Steel Corp.

### Airaloy

A low temperature non-deforming die steel. Contains C 1.00, Mn 2.00, Cr 0.90, Mo 0.90. Republic Steel Corp.

### Aircrat

Air hardening precision ground flat stock. Contains C 1.00, Mn 1.30, Si 0.45, Cr 5.00, Mo 0.80, Va 0.20. Marshall Steel Co.

### Airdi 150

A high carbon, high chrome steel for axle burnishing tools, blanking dies, broaches, burnishing rolls, clay pulverizing blades, cold extrusion dies, etc. Contains C 1.50, Cr 11.50, V 0.20, Mo 0.80. Crucible Steel Co. of America.

### Airmo

A low heat air hardening die steel for cold work. Contains C 1.00, Mn 2.00, Cr 1.00, Mo 1.00. Firth Sterling Steel & Carbide Corp.

### Alhead

An alloyed cold heading die steel which retains the case-core relationship of straight carbon tool steels but having higher wear resistance. Contains C 1.00, W 1.50, Co 1.50. Allegheny Ludlum Steel Corp.

### Alva Alloy Hollow Drill Steel

A C-V hollow drill steel. Crucible Steel Co. of America.

### Alva Extra

C-V tool steel, for mining tools, pneumatic rivet sets, punches, reamers, shear blades, stone tools, taps, threading dies, etc. Contains C 0.95 to

1.20, V 0.20. Crucible Steel Co. of America.

### Annite No. 1

Wear resisting steel for general production purposes where shock is absent and long life is the primary requirement. Contains C 2.25, Mn 0.30, Si 0.25, Cr 13.00, V 0.20. Bissett Steel Co.

### Arrestite Oil Hardening

A die steel. Contains C 0.90, Mn 1.55, Cr 0.25. Republic Steel Corp.

### Atlas Refined 8-10

Plain carbon steels containing C 0.80 to 1.00. Atlas Steels, Ltd.

### Atlas XX95.

A plain carbon steel. Atlas Steels, Ltd.

### Atmos

An air hardening tool steel for dies and punches. Ludlow Steel Co.

### Auger

A plain carbon steel. Ziv. Steel & Wire Co.

## B

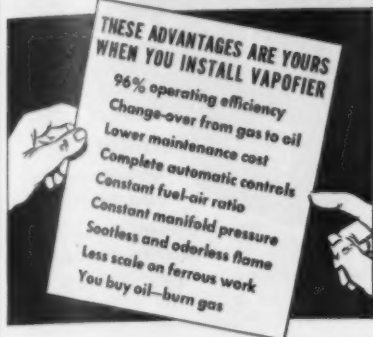
### B-4-a

High tungsten steel for hot work applications. Resists heat checking. Contains C 0.30, Mn 0.30, Si 0.25, Cr 4.00, W 0.15, V 0.50. Universal-Cyclops Steel Corp.

Turn to Page 232



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## —Technical Briefs—

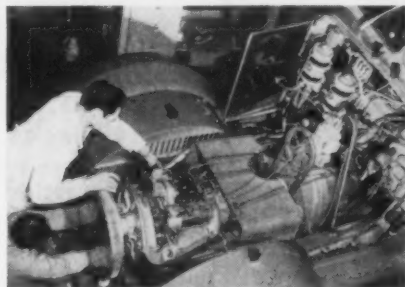
### Turbine:

Rubber to metal bonded coating used in gas turbine coupling.

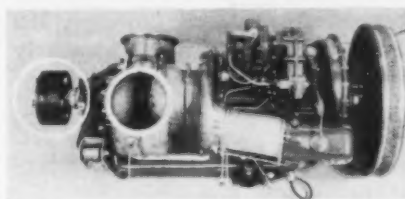
Many western motorists have passed a large Kenworth tractor and its heavily loaded trailer without realizing that it is the first truck to be driven by a turbine instead of a reciprocating engine.

The 16,000-lb tractor, its 10,000-lb trailer, and a cargo of 42,000 lb have been driven over 15,000 miles of mountain roads with all power delivered to the wheels through a shear-type flexible coupling made of rubber bonded to metal parts.

This coupling was developed by Lord Mfg. Co., Erie, Pa., specialists in the bonding of rubber to metal.



TURBINE in motor well of trailer tractor is easily accessible. Rubber bonded to metal is used in flexible coupling.



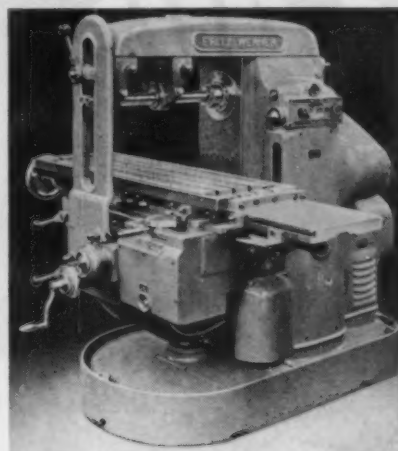
BOEING Airplane Co. developed the 175 hp turbine. Powerful motor moves 34 ton combined truck and trailer loads over mountain roads.

The gas turbine, developed by Boeing Airplane Co., Seattle, has a 2-shaft design which develops 175 hp.

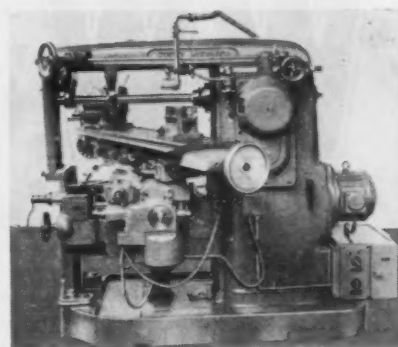
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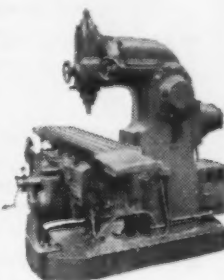
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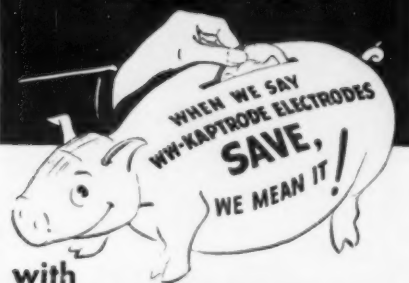


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## —Technical Briefs—

### Aluminum:

Casting alloy developed by Air Force has improved properties.

Improved mechanical properties are available in a cast aluminum alloy recently developed at the Materials Laboratory at Wright-Patterson Air Force Base, Dayton, Ohio.

The alloy, known as ML, contains about 2 pct Ni, 4 pct Cu, 2 pct Mg, and traces of vanadium, chromium, titanium and manganese.

In addition to higher tensile properties, creep and stress-rupture properties at temperatures between 500° and 700°F are approximately 35 pct higher than other light metal alloys previously used for cast aircraft components, according to "Technical Data Digest."

New trends in aircraft design require cast parts, formerly operating at from 200° to 300° F, to withstand temperatures as high as 600° F.

Room temperature properties are similar to those of "Y" alloy, which also contains 2 pct Ni along with copper and has been a standard material for aircraft castings.

Tensile strength of both is about 33,000 psi, as cast, at room temperature. At 600° F, however, ML shows a typical strength of nearly 17,000 psi as against 13,000 for "Y" alloy. Heat temperature increases the tensile strength of ML alloy to 44,000 psi at room temperature.

### Use Neoprene on Tank Exteriors

Neoprene coatings for tank exteriors are now available to cut maintenance costs connected with corrosion. Described at a recent meeting of the National Assn. of Corrosion Engineers in St. Louis, the coatings protect tanks against splash, spill and corrosive fumes and atmospheres.

Chief ingredients are an aromatic solvent, carbon black, neoprene and an accelerator. It dries by evaporation and cures by polymerization of the neoprene.

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## Automatic

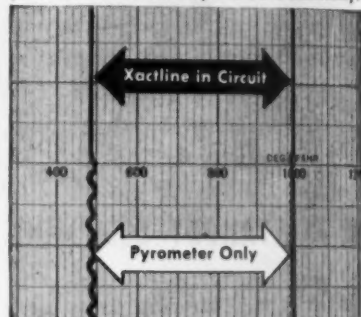
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Exact reproduction of temperature chart for a heating process showing the comparison of the "Straight-Line" temperature control produced by XACTLINE and the saw-tooth curve obtained with only conventional control.

XACTLINE is applicable to any indicating or recording pyrometer control of the millivoltmeter or potentiometer type. It should be used wherever close temperature control is required—any type of electrically heated oven, furnace, kiln, injection molding machine, and fuel-fired furnaces equipped with motor-operated or solenoid valves.

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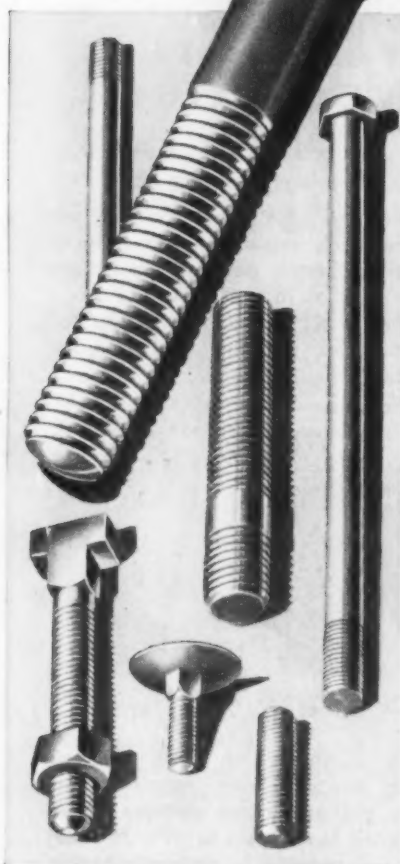
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## —Technical Briefs—

### Filter:

Baltimore sewage disposal plant gets longer life from stainless screen.

A stainless steel filter screen installed in a sewage disposal plant at Baltimore has given more than 12,000 hr service with no sign of corrosive damage.

The filter screen, made of type 317 Armco stainless, replaces the bronze screen formerly used. Maximum life of the latter was about 4500 hr.

The stainless steel screen is 5x5 mesh made from 0.054-in. diam wire woven to an 0.080-in. thick screen by Cambridge Metal Cloth Co. It is fastened to the filter with 0.081-in. diam Type 317 wire held in place with 18-8 stainless staples.

When last inspected the screen was covered with a red rust deposited by the sludge filtrate.

Examination revealed a bright surface free of pits or crevice corrosion. By order of NPA stainless steel may not be used today for this purpose.

### Conveyer Has Simple Design

Lubrication, distortion, warpage and rapid wear are some of the problems faced in design of conveyers to handle hot bulk materials, J. Walter Snively of the Chain Belt Co., recently told the American Institute of Mining & Metallurgical Engineers meeting in Milwaukee.

Two approaches have been used in designing conveyers to handle materials over 400° F. First, common construction metals have been used in combination with simple, rugged, functional conveyer design. Oversize parts, excess capacity, slow operating speeds, and shielding of working parts from high temperature zones are considered.

Second, special heat resisting alloys for working parts, insulation, and heat dissipation minimize the effects of high temperatures encountered in sintering, nodulizing and other production where substantial tonnages of hot bulk materials must be handled.

Turn to Page 286

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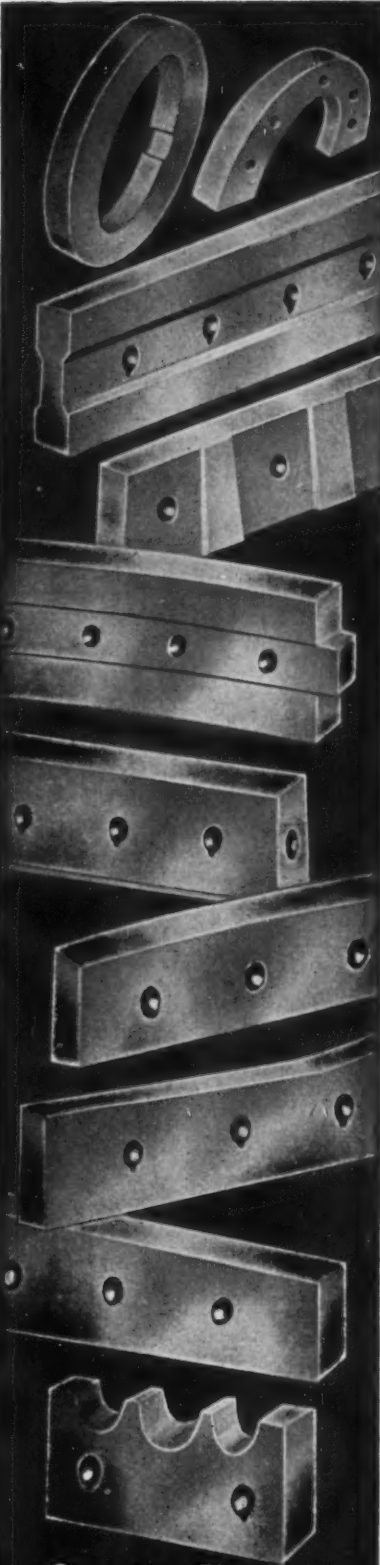
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## —Technical Briefs—

### Studs:

Powder powered tool sets fasteners in steel or concrete at high speeds.

Hammer and star drill may soon be old fashioned tools for setting up studs and fasteners in concrete, steel and other building materials.

An unusual power tool that sets studs 85 pct faster than standard methods, is powered by a blank cartridge. The device was developed by Ramset Fasteners, Inc., of Cleveland.

The tool consists of a barrel, carrier and firing pin assembled in a safety tube and recoil housing. It is loaded by unscrewing the barrel from the safety tube and inserting the fastener in the barrel breech. Next, a cartridge is put into the breech plug. Finally, the barrel is reassembled into the housing, and the tool is ready for operation. Loading takes about 15 seconds.

The operator places the tool against the surface and twists the handle. The cartridge is discharged and the expanding gases blast the fastener down the barrel and into the work at high velocity.

Rapidly loaded or discharged, the tool will set fasteners in concrete, steel, mortar or wood. The force with which the tool drives a fastener into steel anchors it there with a holding power up to 3½ tons. Holding power in concrete ranges up to 1700 lb.

In steel, the fastener point must extend through the metal. Grains of the pierced steel are temporarily displaced sideways. In a short time, the heavily cold-worked steel grains tend to relax and resume their normal positions.

### Draw Bar Helps Change Arbors

A pneumatically operated draw bar developed for a No. 3 Cincinnati milling machine has cut the time required to change arbors from 3 min to 10 sec. The attachment, developed by the Texas Engineering & Mfg. Co., uses a 6-in. pneumatic cylinder operating at 40 lb pressure, and a quick change adaptor on the arbors. The draw bar pin is coordinated with the spindle key.

Turn to Page 288

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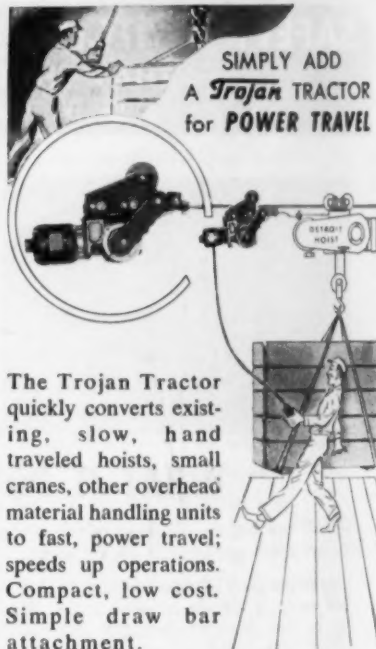


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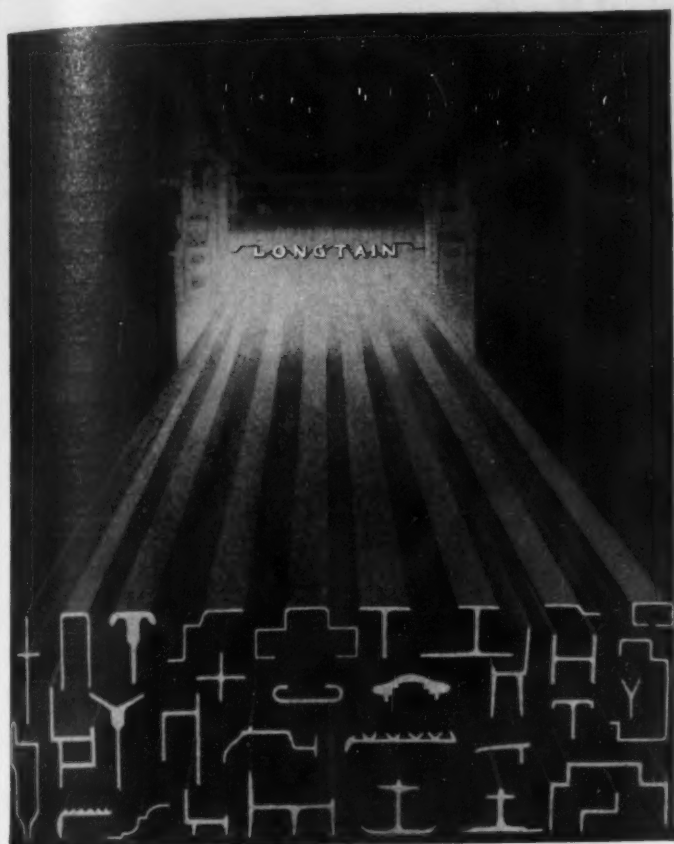
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## —Technical Briefs—

### Coal:

**Yield from six beds in Somerset County upgraded in U. S. tests.**

Coal from six of seven beds in Somerset County, Pa., can be upgraded to metallurgical standards, according to tests recently completed by the U. S. Bureau of Mines.

The report is based on float-and-sink tests of coal samples collected from 23 mines from the following beds: Sewickley, Pittsburgh, Upper Freeport, Lower Freeport, Upper Kittanning, Lower Kittanning, and Clarion. Only the Clarion bed samples were not approved.

The Pittsburgh bed, mined for years, is no longer a dominant source of fuel in Somerset County, according to the report. The Clarion bed contains too many sulfur impurities to permit upgrading. Nevertheless, this county contains one of the largest reserves of low-volatile bituminous coal in Pennsylvania.

The Lower Freeport and Upper Kittanning beds will yield satisfactory coking coal, the latter being especially responsive to fine crushing for the release of sulfur. Some Upper Freeport bed coals can be upgraded by an easy washing operation while others will require fine crushing.

The Lower Kittanning bed's northern section contains less ash and sulfur than the southern part, but all of its coal can be upgraded to metallurgical standards. The Sewickley bed reserves are limited, but careful rejection of inferior top coal would permit use of this bed for coke making.

A free copy of the report, "Preparation Characteristics of Coal from Somerset County, Pa.," may be obtained from the Bureau of Mines, Publications Distribution Section, 4800 Forbes Street, Pittsburgh 13, Pa.

### Phosphate Coatings Shown

Phosphate coatings used in the cold-forming and drawing of steel will be demonstrated by the Detrex Corp. at the 1952 meeting of the American Society of Tool Engineers in Detroit, Mar. 17-21.

### Review Carbide Tooling Data

A clearing house on carbide tooling data and carbide problems arising in shell manufacturing has been set up by the carbide cutting tool subcommittee of the American Ordnance Assn.'s Shell Committee. All manufacturers of tungsten carbide cutting tools are represented. Technical data on application of carbides in shell manufacture has been assembled and a list is available to shell producers.

### Protective Coating Described

American industry faces a growing problem in combating corrosion, C. L. Chase of General Electric's Chemical Div. recently told the Los Angeles Paint Production Club.

Losses from corrosion reach multi-billion dollar proportions in normal times and present a greater challenge now because of critical material shortages.

A new protective coating, GE's R-108, was described. It consists of chemically-modified, phenolic derivations and shows resistance to acids and solvents. It is said to be impervious to alkalis, oxidizing materials, and other corrosives against which conventional phenolics have limited usefulness.



"Better move the car off the street, Mamie."

# THOMAS

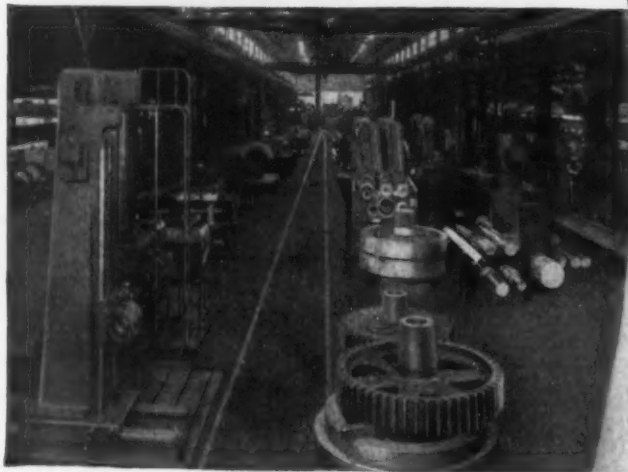
*has the products*

The country's important metal-working plants look to Thomas for the most modern in punching and shearing machinery. From the introduction of the famous Thomas Spacing Tables years ago to today's varied high duty Thomas punching and shearing equipment, Thomas machines have always been noted for their rugged, dependable and efficient construction.

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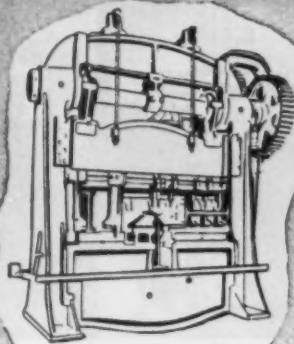
Thomas metal-working machinery is produced in a spacious, daylight plant and is backed by an experienced staff of engineers and technically-trained craftsmen who know and appreciate the exacting needs of the industry. Call on Thomas to help solve your problems.



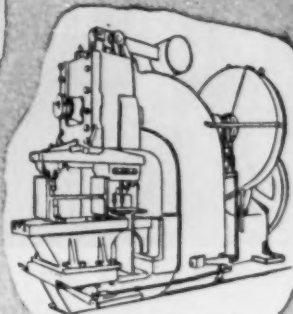
# THOMAS

MACHINE MANUFACTURING COMPANY

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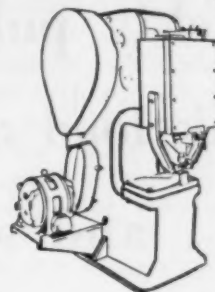
MULTIPLE PUNCHES



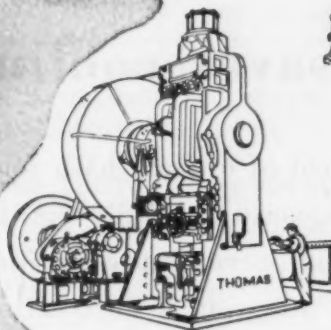
BEAM PUNCHES



HORIZONTAL PUNCHES



VERTICAL PUNCHES



BILLET SHEARS  
8" x 8"

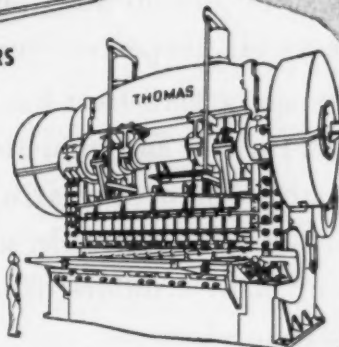
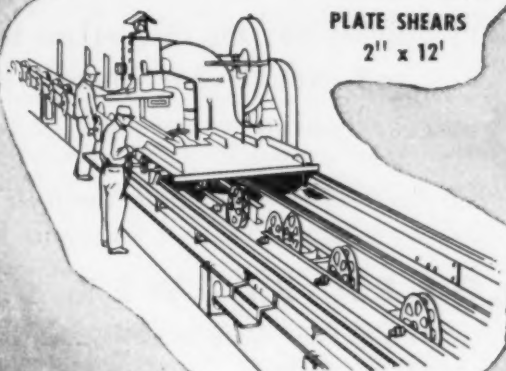
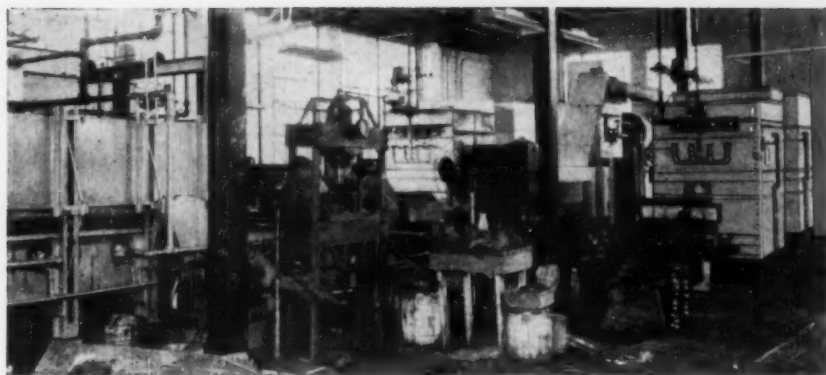


PLATE SHEARS  
2" x 12"



SPACING TABLES





## Niagara Aero Heat Exchanger quickly pulls down the initial peak load of heat in quenching ... and saves cooling water

Accurate control of quench bath temperatures and quickly effective capacity to handle the initial peak load of heat in quenching prevents production set-backs, increases the output of your heat treating department, prevents oil fires, saves you losses from rejected parts.

Niagara Aero Heat Exchangers give you this control in both furnace and induction hardening methods. They prevent both over-heating and over-cooling of the quench bath. Hundreds of heat treaters know they prevent many troubles, constantly improve quality and increase production.

They quickly pay for themselves by saving cooling water coils and extend your quench capacity without extra water or cooling tower.

*Write for Bulletin #120 giving complete information.*

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## Free Literature

*Continued*

### Drafting

Duraline drafting machine scales are described in a new bulletin. Advantages of these extremely accurate, ground aluminum scales are described. Standard scale graduations are shown and an explanation of scale terminology is included. *Universal Drafting Machine Corp.*

For free copy insert No. 15 on postcard p. 291

### Instruments

A new 8-p. bulletin gives quick information, describes research instruments. Data is included on Vibrotest for electrical insulation resistance testing, Vibroground for ground resistance testing and on instruments for testing dielectric strength and current transformers. Information on other special purpose instruments is also included. *Associated Research, Inc.*

For free copy insert No. 16 on postcard p. 291

### Planning

Planning and organization, vital to any successful business project, are discussed in relation to production in a new 12-p. booklet. The importance of sound organization, assignment of responsibility, job definition, communications and procedures are discussed. *Ford, Bacon & Davis, Inc.*

For free copy insert No. 17 on postcard p. 291

### Fork lift trucks

How a fleet of 10 Towmotor fork lift trucks paid for themselves in a year of operation is described in *Handling Materials Illustrated*. The fleet, used in a foundry, permitted increased production of malleable fittings and other castings through improved handling operations. *Towmotor Corp.*

For free copy insert No. 18 on postcard p. 291

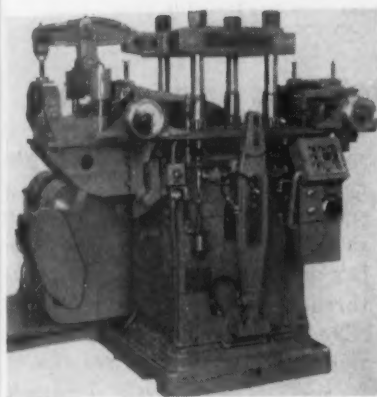
### Pallets

Job-engineered and standard type pallets are illustrated in a new 16-p. booklet. The booklet covers use and application of hardwood pallets for every phase of materials handling. Suggested uses, load limits and other data connected with use of pallets are included. *National Pallet Corp.*

For free copy insert No. 19 on postcard p. 291

# NEW equipment

New and improved production ideas, equipment, services and methods described here offer production economies . . . fill in and mail postcard on page 291 or 292.



## Dieing machine operates at high speeds

A 60-ton high speed dieing machine has an operating range of 155 to 475 strokes per min. The machine can produce one completed rotor and one completed stator lamination at each stroke from a multiple-station progressive die operating at a speed substantially in excess of those customarily employed for laminations of this size. Standard equipment are double roll feed, adjustable scrap cutter attachment, automatic

lubrication to the principal bearings, pneumatically actuated friction clutch with pushbutton control, and pneumatic counterbalance for the reciprocating parts. Special features include a new roller clutch drive for the roll feed units designed for precision feeding over the entire speed range, and micromatic adjustment of the feed pitch. *Henry & Wright, Div. Emhart Mfg. Co.*

For more data insert No. 20 on postcard p. 291

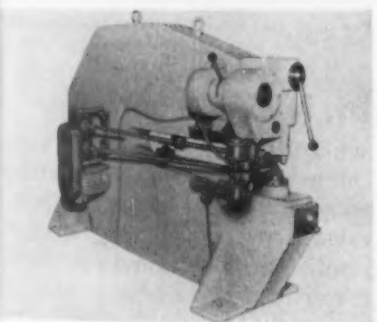


## Surface grinder features reversed cup wheel

This Reichle & Knoedler surface grinder has a reversed cup grinding wheel, that is imbedded in a hardened and ground rectangular shaped table. The grinding cup is mounted directly on the motor spindle and the motor itself with all its controls is placed in the machine base. A straight edge guides the hand-fed workpieces across the slightly tilted

cup wheel. Wet grinding and dust removing equipment are available. In order to be able to grind surfaces close to a raised boss or the like, the table is hinged up to the edge of the cup and can be swung aside to provide for any workpiece protrusion close to the grinding surface. *Eric R. Bachmann.*

For more data insert No. 21 on postcard p. 291

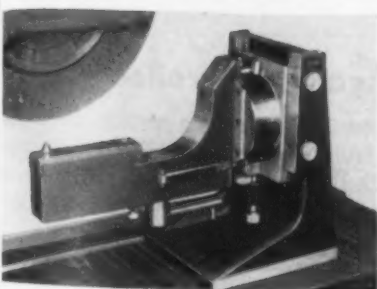


## Power feed used on sheet working machines

The power feed has been developed for use on the Pullmax Major, Model P-5 and Model D-3 to aid in cutting and working steel plate up to 11/32 in. thick. This device can be used for cutting disks and circles on a production basis. It reduces manpower, speeds up cutting time and removes the variables of vibration sometimes caused by hand

feeding. Pullmax machines cut steel or other metals by a reciprocating upper tool operating with a stationary lower tool. They do straight, circle and irregular cutting, inside or outside of the metal. Other tools permit beading, folding or joggling, nibbling and louvering. *American Pullmax Co., Inc.*

For more data insert No. 22 on postcard p. 291



## Grinding wheel dresser has accuracy to 0.0001 in.

A new model wheel dresser designed for dressing any wheel from smallest diameter up to 36 in. maintains an accuracy of 0.0001 in. up to 14-in. diam wheels and to 0.0005 in. on 36-in. diam wheels. A fixture for under wheel dressing makes the Fluidmotion dresser versatile. It

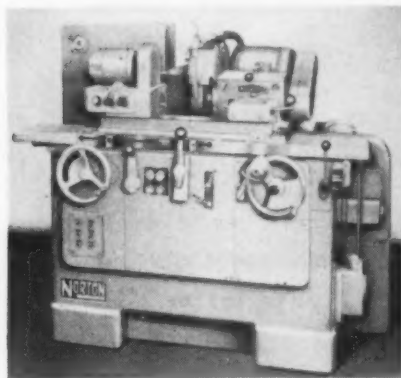
can be adapted to cylindrical, tool and cutter grinders, as well as internal grinders of the Heald No. 72A3 type. Fluidmotion dresses two angles tangent to a radius in one continuous motion. *J & S Tool Co., Inc.*

For more data insert No. 23 on postcard p. 291

Turn Page

## New Equipment

Continued

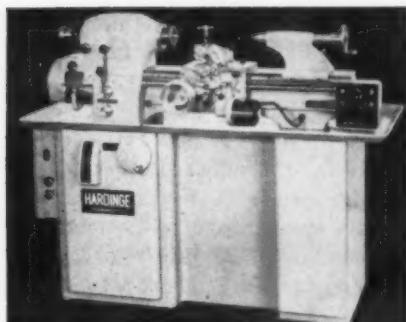


### Grinder handles small cylindrical parts

For fast, accurate grinding of small cylindrical parts the Norton 4-in. Type CTU is available as a plain machine or as a semiautomatic in work length capacities of 12 or 18 in. Wheel feeds and jobs setup are simplified by a graduated, wheel-feed handwheel. Graduations indicate the amount of feed as the handwheel is rotated past a fixed pointer. A click-count indexing mechanism provides the ad-

vantage of making fine feed settings by feel rather than by setting index pin in target; the mechanism clicks a detent on rotation of its control knob, each click representing the setting for 0.0001 in. work diameter reduction. Grinding and truing table speeds are independently adjustable. Automatic and manual control of work rotation is provided. *Norton Co.*

For more data insert No. 24 on postcard p. 291

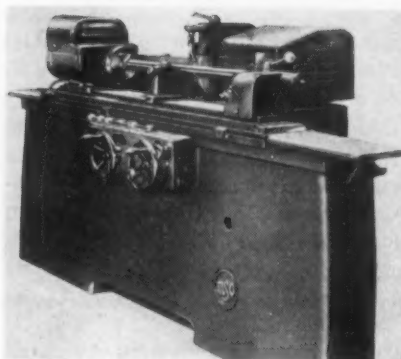


### Accuracy, high speeds obtainable on new lathe

Work is speeded up and accuracy assured on a new precision tool room and production lathe through three major features: an independent variable feed for carriage and cross slide, so the rate of feed can be changed instantly without stopping the machine to shift gears; an independent variable speed for the headstock spindle to secure

every possible combination of speeds within the range 125 to 3000 rpm; precision gear box and lead screw reserved for threading only so the original accuracy of the gear box and lead screw is sustained for threading. One precision straight edge aligns headstock, carriage and tailstock. *Hardinge Bros., Inc.*

For more data insert No. 25 on postcard p. 291

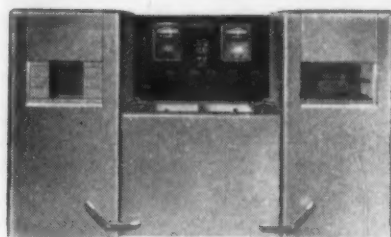


### Machines will grind to 0.0004-in. tolerance

New German-made cylindrical grinders are furnished with in-feed controls that assure quick and precise grinding on a high-production basis. Some unusual operating procedures are as follows: Longitudinal grinding with in-feed by hand or power at each reversal of the table; plunge-cut grinding with automatic grinding and quick return traverse of the wheel-head; plunge-

cut grinding by means of a deferring relay with automatic disengaging of the table; and plunge-cut grinding by an electrical size-grinding device that automatically disengages the table, stops the rotary movement of the work and coolant supply followed by quick return traverse of wheel-head. *Albert Klingelhoefer Machine Tool Corp.*

For more data insert No. 26 on postcard p. 291



### Complete heat-treating dept. in single unit

Small in size, compact in design, a new Model CH heat-treating furnace provides all the advantages of a full-scale heat-treating department. It is completely equipped for heat-treating all types of water or oil-hardening steel; can be used for

annealing, normalizing, pack hardening, stress relieving. Requiring very little floor space, it can be located anywhere in the shop or plant. No highly skilled operator is required. *Waltz Furnace Co.*

For more data insert No. 27 on postcard p. 291



### Air powered drill is electrically controlled

Named the Hydrair, a new drilling device is electrically controlled but air powered with the feed rate hydraulically controlled. Drilling capacity is  $\frac{1}{4}$  in. with maximum depth of stroke 4 in. Rapid advance,

controlled feeding through the work and rapid return are its features. All controls are built in. Standard spindle rated free speed is 2800 rpm. *Bellows Co.*

For more data insert No. 28 on postcard p. 291

Turn Page



# New MEAD INDUSTRIAL AIR POWER CATALOG *ready -*

**Full of suggestions  
FOR FASTER,  
CHEAPER PRODUCTION**

New MEAD AIR POWER CATALOG illustrates, describes the complete line of famous MEAD-DESIGNED Air Operated Devices which have been speeding work, saving time and money for America's most "Cost Conscious" plants! Get your copy.

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**Air Presses**



**Rotary Work Feeders**



**Air Vises**



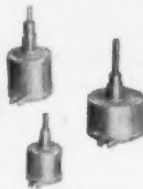
**Drill Press Feeds**



**Impact Hammers**



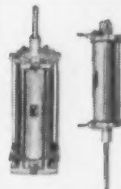
**Midget Air-Clamps\***



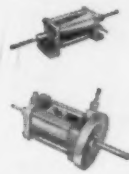
**Single Acting Air-Cylinders\***



**Double Acting Air-Cylinders\***



**\*AIR CYLINDERS**



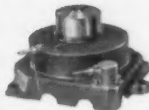
**Air Valves**



**Meadmatic Timers**



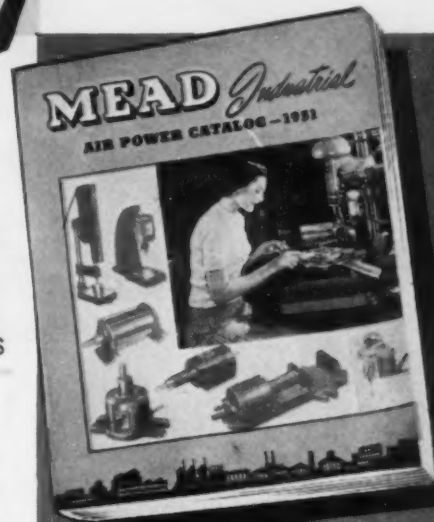
**Other Work Feeders**



**Air Collet Fixtures**



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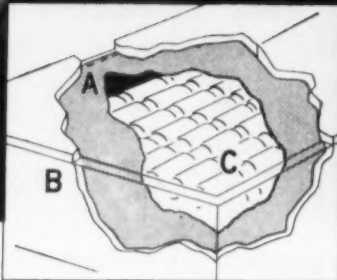
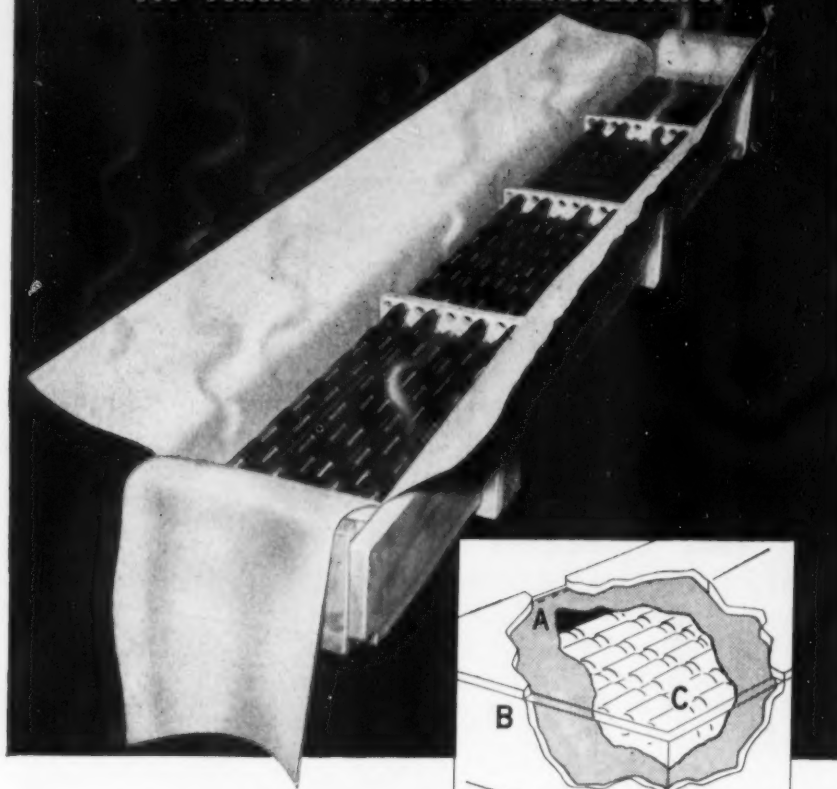
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March 6, 1952

297

# Vapor-from-Paper STOPS RUST

for Textile Machine Manufacturer



Here, messy grease and oil coatings have had their day. Now, in only the time it takes to line a box, textile machine parts are ready to ship or store with no chance of rusting.

Angier VPI\* Wrap gives off a vapor that protects for months on end. Because slushing is eliminated, customers are saved the time and trouble of "cleaning".

This vapor method of packaging already has been PROVEN more effective . . . more economical for protecting these products:

- |  |                                      |
|--|--------------------------------------|
| ( ) Machinery - Industrial, Metal Working, Farm, Office, Construction. | ( ) Steel in process of fabrication. |
| ( ) Electrical Machinery, Appliances, Products.                        | ( ) Instruments and clocks.          |
| ( ) Fabricated Products—Cutlery, Hardware, etc.                        | ( ) Ordnance Equipment.              |
| ( ) Transportation Equipment—Aircraft, Auto, Naval, Railroad, etc.     | ( ) Others:                          |

**HOW IT WORKS!** Used here as a box liner, Angier VPI Wrap (A) gives off a vapor. This magic-like vapor permeates the area within box (B) to prevent rust of machine parts (C). *Saco-Lowell Photo*

Check your product now. Send this with your letterhead to get VPI facts and name of Angier's distributor near you. Send today to the most experienced name in vapor rust preventives . . . Angier Corporation, Framingham 10, Massachusetts.



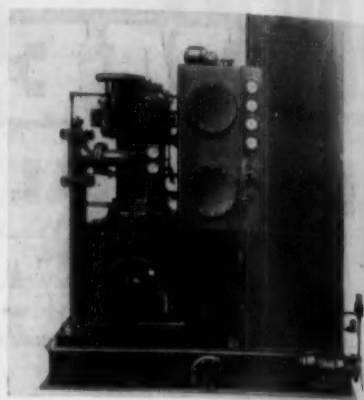
## VPI\* WRAP

\* ® Vapor Rust Preventive

Visit our booth No. 141-143 — Tool Engineers' Industrial Exposition — March 17-21

## New Equipment

Continued



### Oxygen at a saving

A semi-portable oxygen generator will enable industrial users to produce their own high purity oxygen at reported savings up to 50 pct. The generator is a compact unit requiring a space of 600 cu ft. Simplicity is its keynote and it has a minimum of moving parts. The machine has no dependence on chemicals and nothing is consumed except air and power. Models are to range in size from 0.5 to 12 tons daily capacity of oxygen of 99.5 pct purity. Heart of the oxygen generator is a series of automatic reversing heat exchangers which eliminate the expense of chemical purification of the air and contribute to high efficiency. *Joy Mfg. Co.*

For more data insert No. 29 on postcard p. 291

### Electron drills

Complete removal of 8/32-in. taps in less than 4 min and 3/16-in. drills in 6 min is guaranteed possible with new Electron Drills. No damage is done to either the original threads or the workpiece. Electron Drills work on the principle of creating a series of intermittent arcs which disintegrate or vaporize metal. *Elox Corp.*

For more data insert No. 30 on postcard p. 291

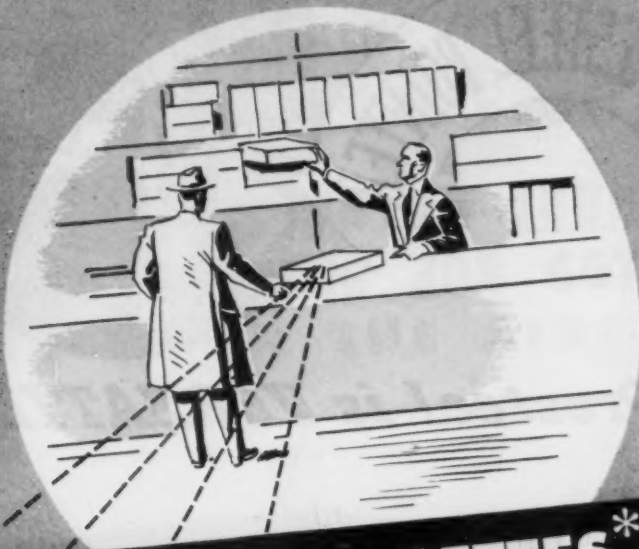
### Magnesium tongs

Fully adjustable handles on new magnesium safety tongs provide greater ease and flexibility for press and shear feeding operations. Simply operated, the tongs adjust instantly to any desired position. Tension at the points of adjustment is automatically maintained. *Magline, Inc.*

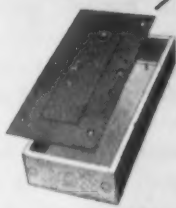
For more data insert No. 31 on postcard p. 291

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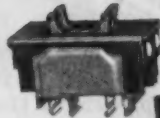
# Off-the-Shelf DELIVERY!



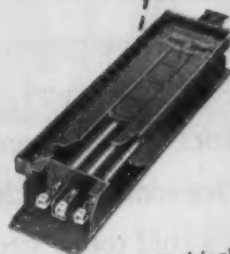
## SQUARE D "PLUG-IN" PANELETTES\* FOR LIGHTING AND POWER SYSTEMS



• Trims and boxes separately packaged. Flush or surface type. Flush lock—directory frame—ample knockouts.



• "Plug-in" thermal-magnetic circuit breakers—individual cartons. 15 to 100 ampere ratings available.



• Interiors with cylindrical bus bars and neutral plate.



### NMO

• "Plug-in" lighting panellettes for 2 to 40 circuits—lugs or circuit breaker mains. 15 to 50 ampere 120/240 volt A.C. circuit breaker branches.



### MHP

• "Plug-in" distribution panellettes for 240 volt, 3 phase, 3 or 4 wire A.C. systems. 15 to 100 ampere breaker units, power or lighting applications.

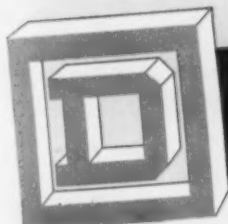
**TIME SAVERS**—varying job requirements can be met by using different combinations of standardized components—immediately available from Electrical Distributor stock.

**MONEY SAVERS**—moderate initial cost. "Plug-in" design reduces installation cost substantially.

**LESS MAINTENANCE**—sturdy, simplified design and construction. Positive-pressure contact jaws. Fewer bolted connections.

\*A PANELETTE is an Underwriters' approved panelboard, packaged in component form for flexibility in stocking and "off-the-shelf" delivery.

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# SQUARE D COMPANY

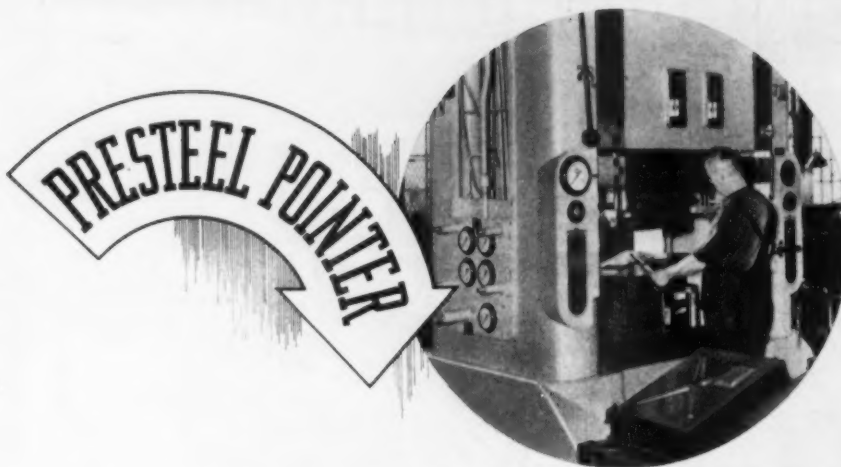
DETROIT

MILWAUKEE

LOS ANGELES

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**...Presteel is *VERSATILE!***

**A**t Presteel, metalworking equipment covers a wide scope of production . . . guarantees efficient handling of stamping problems in all workable metals.

Throughout the quarter-million square feet of manufacturing floor space are 230 precision presses, from large hydraulics, up to 1500 tons pressure, to the smaller, high speed automatics. Sixteen annealing furnaces, extensive facilities for tooling, machining, welding and finishing—plus a cold rolled steel mill of 700 ton capacity a month—allow Presteel to offer advantages unexcelled in any similar plant.

Presteel is in an unusual position to serve you with BIG production, FAST production, VARIED production. And Presteel production is scheduled to meet your emergencies. Investigate Presteel stamping service **NOW!**

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**"PRESTEEL...where problems are shaped into products"**

## New Equipment

*Continued*

### Conditioning agent

For industrial paint spray booths, a new conditioning agent is used in the water circulating system and is designed to prevent adhesion of paint to the curtain wall and to assist the water cascade in preventing escape of paint into the atmosphere. Production tests show that even under prolonged operation the product prevents clogging of nozzles, louvers, baffles and return lines. PB-1 precipitates some types of paints on the surface of the water reservoir, permitting easy removal for subsequent disposal or reclamation. *Pennsylvania Salt Mfg. Co.*

For more data insert No. 32 on postcard p. 291

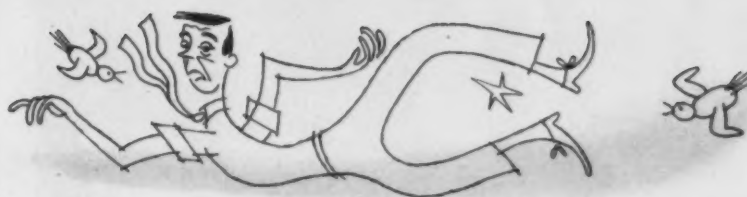
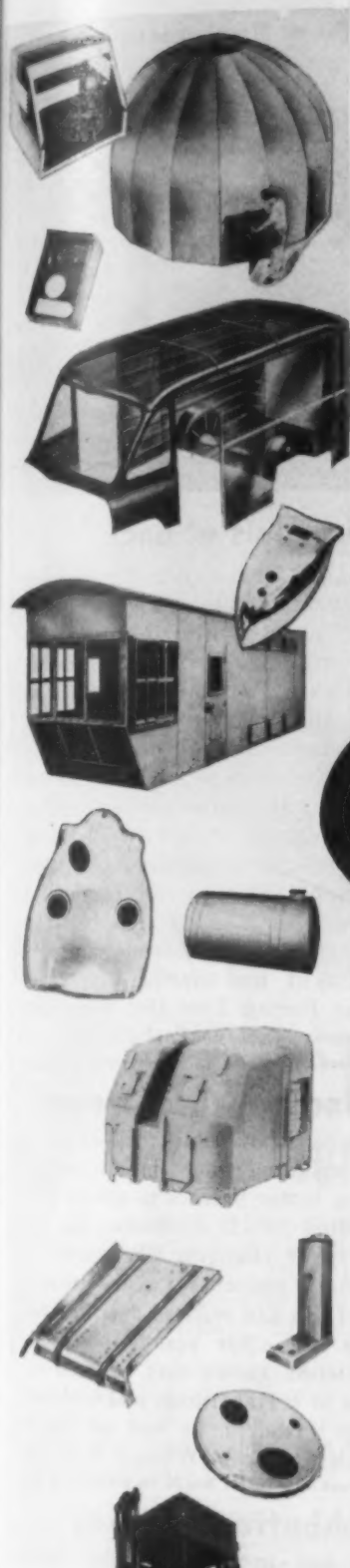
### Toggle presses

New four-point, double-action, toggle drawing presses feature quick advance and return speeds and extreme accessibility for maintenance purposes. The presses are specially designed to meet the needs of the automotive and allied industries by making possible higher production rates for large-area, drawn stampings. An Eddy Current Clutch provides for quick approach to the work, slow-down to give proper drawing speeds, and quick return speed to the top of stroke. With comparatively slow drawing speeds, a rapid press cycle is said to be possible. Presses are built in a complete line of sizes and widths. *E. W. Bliss Co.*

For more data insert No. 33 on postcard p. 291



*Turn Page*



## HAS PRODUCTION ON YOUR METAL WORKING JOB GOT YOU UP IN THE AIR?\*

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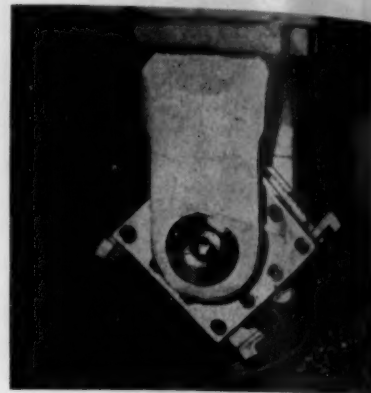
**TOOL  
COLUMBIA  
STEELS**

**COLUMBIA TOOL STEEL COMPANY**

Main Office & Works—Chicago Heights 1, Ill.

## New Equipment

Continued



### Four tools at once

Designed for use on vertical boring and turning mills, an eight-position tool holder requires only one simple wrench adjustment to change position and enables an operator to turn, undercut, bore and chamfer in one setup. Four tools can be mounted at once, with positive position assured by two index pins. Accuracy is assured by the cast steel body of the holder. Position can be changed through 360° in accurately indexed increments of 45°. A center pin locks the complete assembly in rigid alignment and clamps it solidly. *Davis Boring Tool Div., Giddings & Lewis Machine Tool Co.*

For more data insert No. 34 on postcard p. 291

### Grinding wheel mount

Lessened vibration is claimed for a new grinding wheel mount, resulting in better finishes to almost any grinding job. It eliminates the necessity of changing the wheel to obtain a smoother finish. Greater wheel life and reduced operator fatigue are other results obtained. The wheel mount may be used on types of portable tools and tool and cutter grinders, as well as bench grinders. *Chicago Wheel & Mfg. Co.*

For more data insert No. 35 on postcard p. 291

### Pushbutton with key

New key-operated cylinder-locks for oil-tight pushbuttons are available in two basic types. The selector switch has either two or three rotary positions; the pushbutton type can be depressed in either full or intermediate positions. Several models cover virtually all possible conditions. *Westinghouse Electric Corp.*

For more data insert No. 36 on postcard p. 291  
Turn Page





## **"Dag" Colloidal Graphite...** **for Hot-Working Operations**

At 500° F., and virtually as far up as you ever go in metalworking operations, **"dag"** colloidal graphite is a lubricant that does not gum up . . . that defies break-down. For brass, bronze, aluminum, magnesium, carbon steel and stainless steel . . . wherever your fabrication problems are friction and heat . . . this unusual lubricant reduces one and resists the other.

**"Dag"** colloidal graphite is available in dispersions designed to lubricate under all conditions of deep piercing, forging, stretch-forming, wire-drawing and ingot stripping . . . to assist in the parting of castings . . . to lubricate permanently parts that may be subject to extremely high temperatures . . . to be used in degreasing solutions which destroy ordinary lubricants.

When a **"dag"** dispersion is applied to the friction surfaces of metal it leaves a strong, durable graphoid film so thin that even the most sensitive gages cannot detect it. This lubricating film provides the metal with a surface that has an extremely low coefficient of friction . . . a lubricant that resists oxidation and functions far above the burning point of conventional petroleum lubricants.

For more information on the "Use of Colloidal Graphite for Metalworking Operations," write for Bulletin No. 426-13C.



**Acheson Colloids Company, Port Huron, Mich.**

. . . also **ACHESON COLLOIDS LIMITED, LONDON, ENGLAND**

Units of Acheson Industries, Inc.



## Kinnear Rolling Doors

Save money at your service entrances

Installing Kinnear Steel Rolling Service Doors in your service entrances is an investment that quickly pays for itself in at least three ways:

(1) Coiling upward action gives you full use of *all* floor and wall space around doorways. Materials of any kind can be stored within an inch or two of the doors, inside or out, without impeding their operation.

(2) The neat, strong curtain of interlocking steel slats assures long, dependable service and low-cost maintenance.

(3) The all-metal construction of Kinnear Doors gives you extra protection against fire, intruders, wind and storm damage, and other hazards.

By opening straight upward with spring-counterbalanced action, they provide smooth, easy operation under all conditions. They can be equipped for manual, mechanical, or electrical control. Motor operated doors can be equipped with any number of remote control switches, for maximum convenience. Kinnear Doors are built in any size, for easy installation in old or new buildings. Write for complete information.

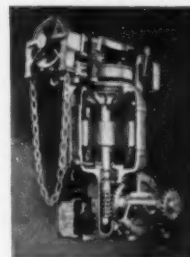
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SAVING WAYS  
IN DOORWAYS

**KINNEAR**  
ROLLING DOORS



## New Equipment

Continued

### Bin-level indicator

Dependable level indication in large bins is possible with a new Bin-Dicator. It is suspended from above and can therefore be located anywhere in the bin where there will be a free flow of material to and away from the diaphragm. The unit is designed to be drilled and tapped to take any size pipe up to 2 in. The pipe accommodates electrical wiring, making conduit unnecessary.

*Bin-Dicator Co.*

For more data insert No. 37 on postcard p. 291

### Countersink

Designed for metal fabricators, a new air tool will countersink a  $\frac{3}{8}$ -in. hole in 75-ST aluminum in 9 sec and is said to give comparable service in 27-ST aluminum as well as alloy steels. The tool has only two controls, one for clamping the tool to the work and one for rotation. A built-in micrometer gives accurate adjustment of the standard bayonet-type countersink. A built-in lubricator assures trouble-free operation.

*Cleco Div., Reed Roller Bit Co.*

For more data insert No. 38 on postcard p. 291

### Helpful attachments

A new power elevation attachment for J&L comparators is a self-contained motor drive unit that will raise or lower the work table faster than it can be positioned by hand. It greatly increases convenience of operation. A new tracing device is used for inspecting surfaces that cannot be projected or reflected. It is shown here being used in inspecting a component of an automatic transmission.

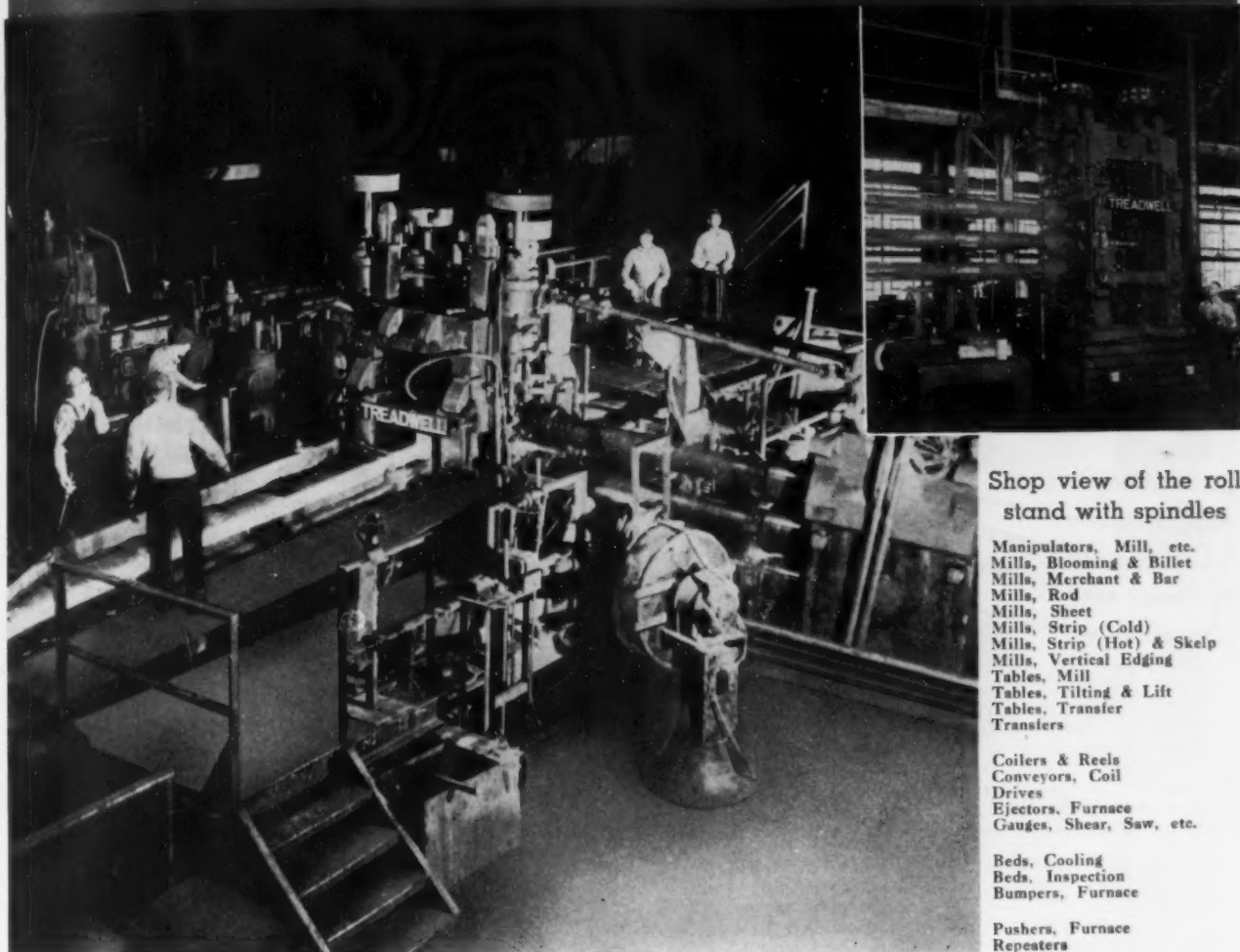
*Jones & Lamson Machine Co.*

For more data insert No. 39 on postcard p. 291



Turn Page

# Treadwell



Shop view of the roll stand with spindles

Manipulators, Mill, etc.  
Mills, Blooming & Billet  
Mills, Merchant & Bar  
Mills, Rod  
Mills, Sheet  
Mills, Strip (Cold)  
Mills, Strip (Hot) & Skelp  
Mills, Vertical Edging  
Tables, Mill  
Tables, Tilting & Lift  
Tables, Transfer  
Transfers

Coilers & Reels  
Conveyors, Coil  
Drives  
Ejectors, Furnace  
Gauges, Shear, Saw, etc.

Beds, Cooling  
Beds, Inspection  
Bumpers, Furnace

Pushers, Furnace  
Repeaters

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Pilers, Cradles, etc.)

Steel and Iron Castings  
Ni-Hard and Ductile Iron  
Castings

Three-High Mill for rolling precision rounds and squares up to and including 5" round or square. The mill is equipped with motor operated screw-downs for both top and bottom rolls.



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# Ingenious New SMITH

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CANNOT HARM SEAT IN THIS NEW SMITH TORCH!

"FLO-TROL," an exclusive Smith feature, absolutely prevents reverse flow of acetylene to cutting valve seat area, thus eliminating danger of pre-mixing and pre-ignition. You can't go wrong. It's fool-proof. Take advantage of this technical achievement to reduce maintenance costs and eliminate production delays. This new Smith Torch with built-in protection really stays on the job . . . keeps production schedules rolling.

Equipment illustrated is Smith's LIFELONG Welding Torch Body with LIFELONG Cutting Assembly. Rugged and full size for general repair maintenance and manufacturing. Complete line of welding tips and special purpose tips is available with this model.

#### Smith's MIDLINE Welding & Cutting Equipment

Medium size and medium weight. Designed for production work and garage trade.

#### Smith's AIRLINE Welding & Cutting Equipment

Feather weight and small size. Ideal for light production, aircraft, body and fender work.

Smith's "FLO-TROL" also protects these two models.



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NO MORE BURNED OUT  
CUTTING VALVE SEATS

NO MORE COSTLY  
DELAYS

Spring-loaded diaphragm prevents reverse flow of acetylene, protects torch against back-fire and burned out seats

Special new design permits rotating welding tip in any direction even while flame is burning!

No WRENCH needed. Finger-tip pressure on nut makes gas-tight seal.

Seal rings keep gases separated until they reach proper place for mixing.

Flexible insert in back-end of cutting assembly prevents leakage of high pressure oxygen.



#### New Equipment

Continued



#### Liquid honing machines

Two new liquid honing machines include a small tool room machine and a larger machine with track and car for handling dies. Both are developed for use in honing tools, broaches, hobs, taps and drills and larger tools like dies and molds. They can be operated from either sitting or standing position. Vapor Blast Mfg. Co.

For more data insert No. 40 on postcard p. 291

#### Reciprocating marker

A reciprocating head marking machine impresses an extra deep mark on tough metal surfaces without exerting extreme pressures and shock to the parts being marked and the marking dies; or where the parts are of such design that they will not withstand the necessary pressure required to make the mark in one pass. The head of the machine automatically passes the marking die back and forth on the part being marked, until the foot control pedal is released. The mark deepens with each pass. Jas. H. Matthews & Co.

For more data insert No. 41 on postcard p. 291

#### Electronic caliper

For in-the-machine measurements, a new electronic caliper makes possible high precision gaging of work in units varying from 0.0001 to 0.00001 in. Four interchangeable jaws for the caliper body provide a measurement range of 0 to 4 in. Aligning attachments are available for use when measuring long workpieces. The caliper is unaffected by moisture or dust and is adjusted easily and quickly. Brown & Sharpe Mfg. Co.

For more data insert No. 42 on postcard p. 291

## Tool room lathe

An 11-in. model lathe with 1-in. collet capacity is built throughout to tool room standards of accuracy and quality. Extra large headstock spindle is mounted in a new, heavy headstock casting. The spindle turns on a double and single row of super-precision ball bearings. A draw bar collet attachment is built in and supplied as standard equipment. The carriage includes finished ground cross slide ways. Large dials on cross and compound feeds are provided with instant adjustment. *Logan Engineering Co.*

For more data insert No. 43 on postcard p. 291

## Dead center

New dead centers of Exmet withstand heat and wear. Exmet is one of the new alloys developed to withstand the heavy wear and stress encountered in high speed, high temperature jet engine operation. Centers are available in all sizes of Morse, Brown & Sharpe and Jarno tapers, both in conventional styles for lathes and in a gashed type for grinding operation or turning where extra clearance is needed. *DoAll Co.*

For more data insert No. 44 on postcard p. 291

## Collet holder

An air-operated collet holding fixture is of such compact size as to permit multiple installation on production indexing tables or where previously rapid positioning of small parts has been impossible. This model uses standard shop collets 1A and 3C styles up to 1/2 in. capacity and design permits handling of long pieces through the entire fixture without interference to capacity. *Modernair Corp.*

For more data insert No. 45 on postcard p. 291



PAT. NOS.  
2,314,391  
2,314,390  
2,272,670  
2,272,640  
2,482,100

*fastenings*

1

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rivets, chaplets, wire forms, and  
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products... in steel, brass  
and other alloy metals.

Blake & Johnson is headquarters for patented **Twin-Fast®** twin-thread wood screws now available with Phillips head as well as slotted round, flat and oval heads—in brass and steel, bright finished—in all standard lengths and diameters and some special sizes; others to order.



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WATERVILLE 48, CONNECTICUT

March 6, 1952



# EX-CELL-O

## MACHINES

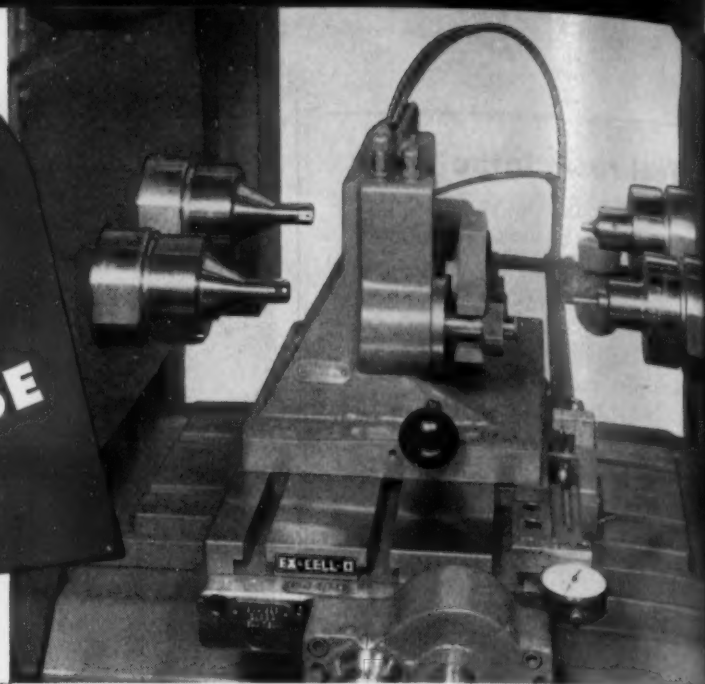
### SPEED DEFENSE



**STYLE 1212-A PRECISION BORING MACHINE**

**UPPER RIGHT:** Style 1212-A Precision Boring Machine equipped with hydraulically clamping fixture supported by a manually operated cross slide for indexing. Operations are precision boring and line-boring.

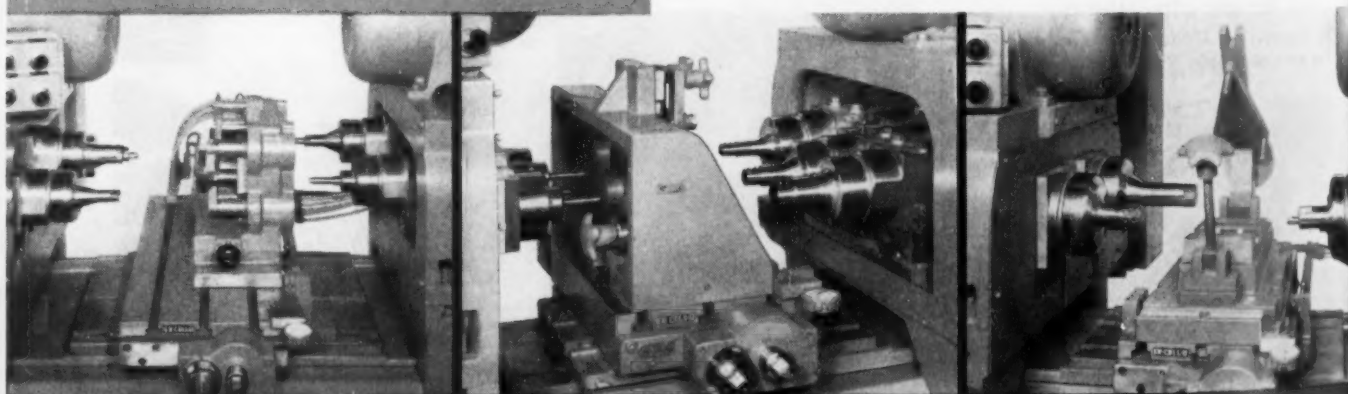
**BELOW:** All eight Ex-Cell-O Precision Boring Machines on this job (like the three shown here) have push button controls conveniently located on the left bridges. The simple fixtures are mounted on cross slides to provide indexing between various boring positions.



## Typical Installation Involves Eight Ex-Cell-O Precision Boring Machines

Typical of Ex-Cell-O's contribution to the defense program is the recent installation of eight double-end Ex-Cell-O Precision Boring Machines in one plant. Used to finish magnesium and steel parts for aircraft electronic devices, they hold bore diameters to within .0005", some hole locations to within .0005", others plus or minus .0002".

While this is not a large program by Ex-Cell-O standards, it is interesting as an example of the help Ex-Cell-O machine tools and engineering are giving our patriotic defense equipment manufacturers. If you can use help of this nature contact your local Ex-Cell-O representative or write, wire or phone Ex-Cell-O in Detroit today.



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MANUFACTURERS OF PRECISION MACHINE TOOLS • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS  
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## Easing Market Embarrasses Controls Officials

**Moves to relax and lift some controls coming . . . But signs of softer market on some products warranted earlier action . . . Scrap pressure eases . . . Ingot rate gains half a point.**

Each new sign of softening steel market adds to the embarrassment of controls officials in Washington. Even they now realize what industry has been howling about for some time—that some civilian users were cut back too soon and too sharply.

To deepen their embarrassment, the terrific rate of steel production widens the gap between supply and permitted use of some products every day. Many consumers (including auto makers) haven't been using all the Controlled Materials Plan tickets allotted them. They aren't interested in getting more steel sheets if they can't also get more copper and aluminum which are also essential.

**About face**—In the past few weeks controls officials have practically reversed their appraisal of the steel market. (1) They have revoked second quarter cutbacks for some consumers. (2) They have boosted some second quarter allotments for civilian use. (3) They have eased construction restrictions and lifted chrome-stainless steels out of CMP.

(4) They have reached a definite decision to decontrol secondary mill products, though formal announcement is being withheld pending agreement on what constitutes a secondary product. (5) They are considering raising legal inventory ceilings for some consumers. (6) Decontrol of some prime mill products is tabled pending settlement of the steel wage-price dispute.

**Right Direction**—National production Authority has been

swayed to some extent by pleas to decontrol tin products. It now plans to issue an amendment to M-25 and provide for the allotment of 35,000 tons of waste-wasters, unmended menders, mill accumulations, and unassorted templets in the first quarter and 68,000 tons in the second quarter. (See p. 173.)

On application to NPA special allotment tickets may be issued without regard to production limits imposed by NPA.

The pressure for decontrol is fast growing to the explosion point. Some mills who would like to sell more to frustrated customers who lack tickets are advising them to hurry to Washington to make controls officials aware of the situation. This is expected to add plenty of fuel to the fire.

**Strike Hedge**—For many weeks steel producers and consumers both have been telling THE IRON AGE that civilian users were cut back too soon and too deeply. Yet Washington controllers have been slow to do anything about it. Signs of a softening market for some steel products have been piling up for more than 3 months.

The amount that controls have been relaxed is hardly a drop in the bucket to what some industry sources recommend. While it was to be expected that controls officials would be reluctant to relax their grip on distribution, the delay in the steel wage price settlement is causing them to drag their feet even more. Washington policy has been opposed to decontrol of any product that might later turn up in short supply. A

strike (still a very real possibility) would do just that to steel.

**Not so Fast**—Despite the apparent weakening of demand for some products, it will be some time before steel production generally exceeds demand—provided controls are relaxed enough to let demand assert itself. A check of major producers shows that they are fully booked on most products through the second quarter.

They expect to have to do some selling to fill their third quarter books. Some of them wouldn't be surprised if the ingot rate declined a little—especially since new capacity will keep coming in so fast. But they expect products such as oil country goods, heavy plate and structurals to continue tight for some time.

**Tough Sledding**—The outlook for small producers and nonintegrated mills is not so good. They are feeling the softening market first. When they are forced to lop off premium prices or even undercut the big mills to fill their order books it will mean financial hardship, because their costs are generally higher.

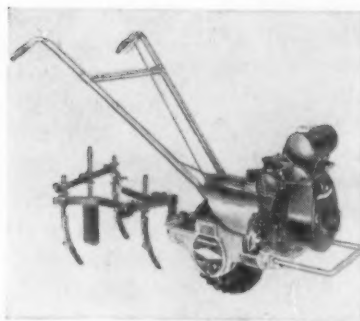
**A Little Easier**—Scrap, which has been one of the steel industry's biggest problems, is getting easier. Mills are cutting down on the amount of freight they'll pay, getting more choosy on quality, and generally showing less appetite for "anything that's scrap". The weakness in cast grades of scrap is even more apparent this week, as additional price declines were noted in several areas.

Steelmaking operations this week are scheduled at 101.5 pct of rated capacity, up half a point from the previous week.

# why *stock steel in long lengths?*

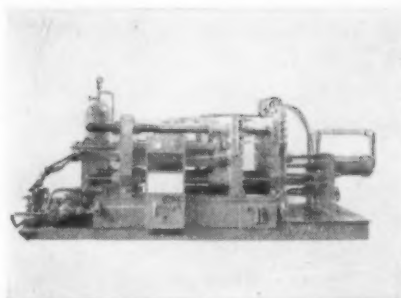
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New Haven • Philadelphia • Rochester, N. Y. • Toledo • Union, N. J. • Washington, D. C. • Worcester, Mass.

## Market Briefs

**First Mill**—Construction on Iowa's first steel mill will begin this month. The \$66 million plant is scheduled to be in operation in 9 to 12 months. North American Steel Co., which will operate the plant, expects to bring iron ore down the Mississippi from Minnesota and coal up the river from Kentucky and Illinois. The mill will operate first as an iron and coke plant and will expand later into a full steel plant.

**Nickel Sale**—Under a contract made through the Defense Materials Procurement Agency, some 50 million lb of Canadian nickel will be purchased by this country over the next 9 years. Purchase of up to 1.5 million lb of cobalt is included in the contract, and there are options also for the buying of up to 25 million lb of copper and a like amount of nickel during life of the contract. Falconbridge Nickel Mines, Ltd., of Toronto, will provide the ore and metals. Under the contract, the United States will advance \$6 million for expansion against delivery of material. In return, the Canadian company has agreed to give this country first call on not less than 40 pct of output. Basic price was agreed upon at 56.66¢ per lb of nickel.

**Open Mines**—M. A. Hanna Co., Cleveland, will open four iron ore mines in the Lake Superior District capable of producing more than 5 million tons of ore a year by 1954. A company jointly owned by Hanna and Republic Steel Corp. has also purchased a substantial tonnage of iron ore on the Maria Luisa property in Venezuela.

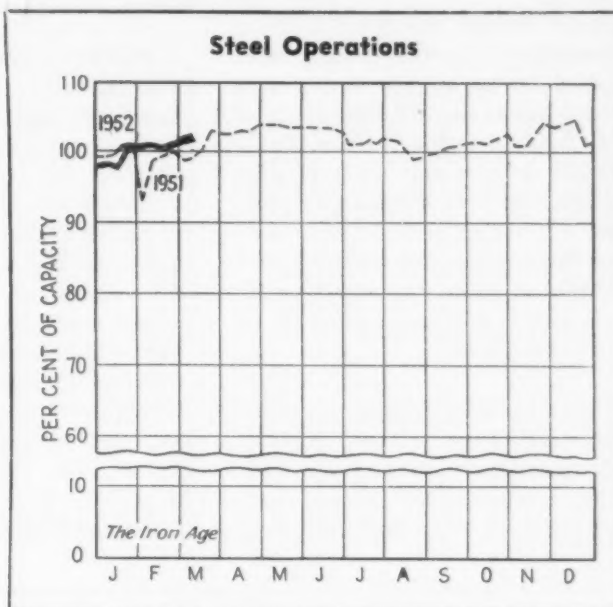
**Site Wanted**—Intermountain and West Coast sites are being explored by Kennecott Copper Corp. for location of a brass casting and fabricating plant, according to Charles E. Cox, president. Chase Brass & Copper Co., a wholly-owned subsidiary, will construct and operate the works, which will be the company's first west of the Mississippi. There are also persistent rumors that Revere Copper and Brass, Inc., is planning to double the size of its Los Angeles plant.

**Construction Schedule**—The first four of eight open-hearth furnaces under construction at the Indiana Harbor Works of Youngstown Sheet & Tube Co. will be started up in April. The final four should be ready by December. A new coke plant is scheduled to be in production next June and a new blast furnace in August. Youngstown will also build a 4-stand continuous cold mill with a minimum annual capacity of 500,000 tons, and a high-lift blooming mill.

**Migration**—Industrial leaders of the United Kingdom are giving serious consideration to the transplanting of British industries in the various countries associated with the British Commonwealth of Nations. Idea is to move industries and skilled manpower to other commonwealth countries. Plan is sponsored by the newly-formed Migration Council of Britain and calls for the transfer of industries now concentrated in the over-populated "target area" of the United Kingdom to Canada, Australia, New Zealand, South Africa and Southern Rhodesia.

**More Taconite**—Reserve Mining Co. will expand its taconite beneficiation program at Beaver Bay, Minn., by 50 pct. Original plans calling for construction of plants and facilities to produce 2.5 million tons of ore annually have been expanded to a rate of 3.75 million tons. No date was given for completion of this expansion, but it is expected to follow in about 2 years after the first plant goes into operation.

**Pattern**—The United Steelworkers Union is following almost identically the same course in the aluminum wage drive that it is in steel. Beginning fact-finding hearings before a six-man panel in Washington this week the union blasted "Alcoa's antiquated conception of wage rates."



**District Operating Rates—Per Cent of Capacity**

| Week of | Pittsburgh | Chicago | Youngstown | Philadelphia | West  | Buffalo | Cleveland | Detroit | Wheeling | South | Ohio River | St. Louis | East  | Aggregate |
|---------|------------|---------|------------|--------------|-------|---------|-----------|---------|----------|-------|------------|-----------|-------|-----------|
| Feb. 24 | 104.0      | 103.5   | 100.0      | 100.0        | 104.0 | 104.0   | 98.0      | 104.0*  | 102.0    | 104.0 | 91.5       | 85.6      | 106.0 | 101.0     |
| Mar. 1  | 104.0      | 103.5   | 100.0      | 100.0        | 102.0 | 104.0   | 101.0     | 103.0   | 101.0    | 102.0 | 91.0       | 78.7      | 98.0  | 101.5     |

Beginning Jan. 1, 1952, operations are based on annual capacity of 108,587,670 net tons.

\* Revised.



## Nonferrous Markets

### Chile Seeking 6c Copper Boost

**Would ship U. S. all copper for 33.5¢ per lb. . . . Set new ceilings for ingot brass and bronze . . . Close 9-year contract for nickel, cobalt with Falconbridge—By R. L. Hatschek.**

With world copper prices slipping from the high of 54.5¢ per lb, Chile is reported to be seeking a new agreement with the U.S. for its copper. At present, Chile, is getting 27.5¢ per lb from the U. S. for 80 pct of its output and is trying to sell the remaining 20 pct in world markets at 54.5¢. Under the proposed new setup, Chile would sell all its copper to the U. S. at 33.5¢.

On an overall average basis, this arrangement would net Chile 0.6¢ more for every pound produced. According to one report, if the Chilean government cannot conclude its negotiations successfully, it would merely levy an additional 6¢ export tariff on the red metal.

**Ingot Prices Pegged**—Dollars and cents ceiling prices have been applied to secondary brass and bronze ingots in CPR 127, effective last Monday. Office of Price Stabilization set the new ceilings generally in line with prices as they were but not all sellers are at ceiling. These prices, previously under the freeze, have fluctuated under the earlier ceilings according to raw material costs.

**Close Nickel Contract**—Defense Materials Procurement Agency has closed a 9-year contract with Falconbridge Nickel Mines, Ltd. The contract includes 25,000 tons

of nickel with additional options for up to 12,500 more tons of nickel, 750 tons of cobalt and 12,500 tons of copper. Prices will be: Nickel, 56.66¢ per lb, f.o.b. vessel in Norway; cobalt, \$1.80 or the

#### MONTHLY AVERAGE PRICES

The average prices of the major non-ferrous metals in February based on quotations appearing in THE IRON AGE, were as follows:

|   | Cents<br>Per Pound |
|---|--------------------|
| Electrolytic copper, Conn. Valley . . . . . | 24.50              |
| Lake copper, delivered . . . . .            | 24.625             |
| Straits tin, New York . . . . .             | \$1.215            |
| Zinc, East St. Louis . . . . .              | 19.50              |
| Zinc, New York . . . . .                    | 20.29              |
| Lead, St. Louis . . . . .                   | 18.80              |
| Lead, New York . . . . .                    | 19.00              |

prevailing market price, which ever is higher (current price is \$2.40), and electrolytic copper, 19¢ per lb in cathode form.

DMPA will advance \$6 million to Falconbridge for expansion of its facilities. In return, the company will offer not less than 40 pct of its nickel and cobalt to the U. S. market until the end of 1956.

**Easing Control**—At press time, National Production Authority had just ended use restriction on lead (see THE IRON AGE, Feb. 28, p. 142). The agency may move in the same direction with zinc if

supplies of that metal loosen up as much as they have in lead.

**Mercury Up**—Prices for mercury had definitely been trending downward but so much metal was taken off the market at the lower figures that it is now becoming scarce. As a result, prices moved upward last week and are now quoted at \$204 to \$207 per 76-lb flask. Spanish prices remain at \$200 f.o.b. Spain,

**Start New Line**—Capacity of Aluminum Co. of America's Point Comfort smelter went up an 11,500-ton notch last week when the first of its two new potlines went into production. This brings actual production in the U. S. to an annual rate of over 900,000 tons.

Next mark to fall will be the million-ton-milestone and before the year is over the rate will hit 1.2 million tons a year.

**Start Wage Talks**—Monday saw the start of wage hearings between Alcoa and the United Steelworkers of America (CIO). At press time, these had barely gotten under way and demands were similar to those made of the steel industry. The union charged Alcoa with having "grossly unjust wage structure" and that employees "need a wage inequity program no less than they need a general wage increase." Alcoa countered with the charge that the union would not allow a settlement by collective bargaining because of similar issues between the steel industry and the union.

Next Monday the hearings switch to the Aluminum Workers Council (AFL).

**Still Play Tin Game**—A settlement between Reconstruction Finance Corp. and the Indonesian tin delegation is still blocked by disagreement on prices and length of the contract. The Bolivian talks have still not resumed but that country is seeking the aid of Argentina in its attempt to get \$1.50 per lb for its tin.

#### NONFERROUS METAL PRICES

|                                  | Feb. 27 | Feb. 28 | Feb. 29 | Mar. 1 | Mar. 3  | Mar. 4  |
|----------------------------------|---------|---------|---------|--------|---------|---------|
| Copper, electro, Conn. . . . .   | 24.50   | 24.50   | 24.50   | 24.50  | 24.50   | 24.50   |
| Copper, Lake delivered . . . . . | 24.625  | 24.625  | 24.625  | 24.625 | 24.625  | 24.625  |
| Tin, Straits, New York . . . . . | \$1.215 | \$1.215 | \$1.215 | .....  | \$1.215 | \$1.215 |
| Zinc, East St. Louis . . . . .   | 19.50   | 19.50   | 19.50   | 19.50  | 19.50   | 19.50   |
| Lead, St. Louis . . . . .        | 18.80   | 18.80   | 18.80   | 18.80  | 18.80   | 18.80   |

Note: Quotations are going prices.

# Nonferrous Prices

## MILL PRODUCTS

(Cents per lb, unless otherwise noted)

### Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188 in., 2S, 3S, 30.1¢; 4S, 61S-O, 32¢; 52S, 34.1¢; 24S-O, 24S-OAL, 32.9¢; 75S-O, 75S-OAL, 39.9¢; 0.081 in., 2S, 3S, 31.2¢; 4S, 61S-O, 33.5¢; 52S, 35.6¢; 24S-O, 24S-OAL, 34.1¢; 75S-O, 75S-OAL, 41.8¢; 0.032 in., 2S, 3S, 32.9¢; 4S, 61S-O, 37.1¢; 52S, 39.8¢; 24S-O, 24S-OAL, 41.7¢; 75S-O, 75S-OAL, 52.2¢.  
Plate 1/4 in. and heavier: 2S, 3S-F, 28.3¢; 4S-F, 30.2¢; 52S-F, 31.8¢; 61S-O, 30.8¢; 24S-O, 4S-F, 32.4¢; 75S-O, 75S-OAL, 38.3¢.  
Extruded Solid Shapes: Shape factors 1 to 5, 36.2¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 36.2¢ to 116¢; 36 to 38, 47.2¢ to 117.0¢.  
Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 37.5¢ to 38.5¢; cold finished, 0.375 to 3 in., 2S-F, 3S-F, 40.5¢ to 38¢.  
Screw Machine Stock: Rounds, 11S-T3, 1/4 to 1 1/2 in., 63.5¢ to 42¢; 1/2 to 1 1/2 in., 41.5¢ to 39¢; 1 1/2 to 3 in., 38.5¢ to 36¢; 17S-T4 lower by 1.5¢ per lb. Base 5000 lb.  
Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 39.5¢ to 29¢; 52S, 48¢ to 35¢; 66S, 51¢ to 42¢; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48.5¢ to 37¢; 75S-T6, 84¢ to 67.5¢.  
Extruded Tubing, Rounds: 63S-T5, OD in. 1 1/4 to 2, 37¢ to 54¢; 1/2 to 4, 33.5¢ to 45.5¢; 4 to 6, 34¢ to 41.5¢; 6 to 9, 34.5¢ to 43.5¢.  
Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., \$1.42; 96 in., \$1.522; 120 in., \$1.902; 144 in., \$2.284. Gage 0.24 x 28 in., 72 in., \$1.379; 96 in., \$1.839; 120 in., \$2.299; 144 in., \$2.759. Coiled Sheet: 0.019 in. x 28 in., 28.2¢ per lb; 0.024 in. x 28 in., 26.9¢ lb.

### Magnesium

(F.O.B. mill, freight allowed)

Sheet and Plate: FS1-O, 1/4 in., 68¢; 3/16 in., 66¢; 1/8 in., 67¢; B & S Gage 10, 65¢; 12, 72¢. Specification grade higher. Base: 30,000 lb.  
Extruded Round Rod: M. diam in., 1/4 to 0.311 in., 74¢; 1/2 to 1/4 in., 87.5¢; 1 1/4 to 1.749 in., 85¢; 2 1/4 to 5 in., 48.5¢. Other alloys higher. Base up to 1/2 in. diam, 10,000 lb; 1/2 to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.  
Extruded Solid Shapes, Rectangles: M. In weight per ft. for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.5¢; 0.22 to 0.25 lb, 5.9 in., 59.3¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.59 lb, 19.5 in., 53.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/2 lb, 10,000 lb; 1/2 to 1.80 lb, 20,000 lb; 1.80 and heavier, 30,000 lb.  
Extruded Round Tubing: M. wall thickness, outside diam. in., 0.049 to 0.057; 1/4 in. to 5/16, \$1.40; 5/16 to 3/4, \$1.26; 3/4 to 1, \$93¢; 1 to 2 in., 76¢; 0.165 to 0.219, 5/8 to 3/4, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1 1/2 in., 10,000 lb; 1 1/2 to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

### Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, \$15; Plate, HR, \$12; Wire, rolled and/or drawn, \$10; Bar, HR or forged, \$6; Forgings, \$6.

### Nickel and Monel

(Base prices, f.o.b. mill)

"A" Nickel Monel  
Sheets, cold-rolled ..... 77 60 1/2  
Strip, cold-rolled ..... 83 63 1/2  
Rods and bars ..... 73 58 1/2  
Angles, hot-rolled ..... 73 58 1/2  
Plates ..... 75 59 1/2  
Seamless tubes ..... 106 93 1/2  
Shot and blocks ..... 53 1/2

### Copper, Brass, Bronze

(Freight prepaid on 200 lb)

|                   | Sheet | Rods  | Extruded Shapes |
|-------------------|-------|-------|-----------------|
| Copper            | 41.68 |       | 41.28           |
| Copper, h-r       |       | 37.53 |                 |
| Copper, drawn     |       | 38.78 |                 |
| Low brass         | 39.67 | 39.36 |                 |
| Yellow brass      | 38.28 | 37.97 |                 |
| Red brass         | 40.14 | 39.83 |                 |
| Naval brass       | 43.20 | 37.26 | 38.52           |
| Leaded copper     |       | 41.58 |                 |
| Com'l bronze      | 41.13 | 40.82 |                 |
| Mang. bronze      | 46.92 | 40.81 | 42.37           |
| Phos. bronze      | 61.07 | 61.32 |                 |
| Muntz metal       | 41.18 | 36.74 | 37.99           |
| NI silver, 10 pct | 49.82 | 52.04 |                 |

## PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed ..... 19.00  
Aluminum pig ..... 18.00  
Antimony, American, Laredo, Tex. .... 50.00  
Beryllium copper, 3.75-4.25% Be... 1.56  
Beryllium aluminum 5% Be, Dollars per lb contained Be ..... \$69.00  
Bismuth, ton lots ..... \$2.25  
Cadmium, del'd ..... \$2.55  
Cobalt, 97-99% (per lb).....\$2.40 to \$2.47  
Copper, electro, Conn. Valley ..... 24.50  
Copper, Lake, delivered ..... 24.625  
Gold, U. S. Treas., dollars per oz. .... \$35.00  
Indium, 99.8%, dollars per troy oz. .... \$2.25  
Iridium dollars per troy oz. .... \$200  
Lead, St. Louis ..... 18.80  
Lead, New York ..... 19.00  
Magnesium, 99.8+%, f.o.b. Freeport, Tex. 10,000 lb. .... 24.50  
Magnesium, sticks, 100 to 500 lb. .... 42.00 to 44.00  
Mercury, dollars per 76-lb. flask, f.o.b. New York ..... \$204 to \$207  
Nickel electro, f.o.b. N. Y. warehouse 59.58  
Nickel oxide sinter, at Copper Creek, Ont., contained nickel .... 52.75  
Palladium, dollars per troy oz. .... \$24.00  
Platinum, dollars per troy oz. .... \$90 to \$93  
Silver, New York, cents per oz. .... 88.00  
Tin, New York ..... \$1.215  
Titanium, sponge ..... \$5.00  
Zinc, East St. Louis ..... 19.50  
Zinc, New York ..... 20.20  
Zirconium copper, 50 pct ..... \$6.30

## REMELTED METALS

### Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot  
No. 115 ..... 27.25  
No. 120 ..... 26.75  
No. 123 ..... 26.25  
80-10-10 ingot  
No. 305 ..... 33.00  
No. 315 ..... 30.50  
85-10-2 ingot  
No. 210 ..... 41.50  
No. 215 ..... 40.00  
No. 245 ..... 34.50  
Yellow ingot  
No. 405 ..... 23.25  
Manganese bronze  
No. 421 ..... 30.50

### Aluminum Ingot

(Cents per lb, 10,000 lb and over)

95-5 aluminum-silicon alloys  
0.30 copper, max. .... 20.6  
0.60 copper, max. .... 20.4  
Piston alloys (No. 122 type) ..... 21.2  
No. 12 alum. (No. 2 grade) ..... 19.5  
108 alloy ..... 20.6  
195 alloy ..... 20.8  
13 alloy ..... 20.8  
ASX-679 ..... 20.5

### Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1-95-97 1/2% ..... 18.80  
Grade 2-92-95% ..... 18.60  
Grade 3-90-92% ..... 18.40  
Grade 4-85-90% ..... 18.20

## ELECTROPLATING SUPPLIES

### Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper  
Cast, oval, 15 in. or longer ..... 37.84  
Electrodeposited ..... 33 1/2  
Flat rolled ..... 38.34  
Forged ball anodes ..... 43  
Brass, 80-20  
Cast, oval, 15 in. or longer ..... 34 1/2  
Zinc, oval ..... 26 1/2  
Ball anodes ..... 25 1/2  
Nickel 99 pct plus  
Cast ..... 76.00  
Rolled, depolarized ..... 77.00  
Cadmium ..... \$2.80  
Silver 999 fine, rolled, 100 oz lots, per troy oz., f.o.b. Bridgeport, Conn. .... 97 1/2

### Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum ..... 63  
Copper sulfate, 99.5 crystals, bbl. .... 12.85  
Nickel salts, single or double, 4-100 lb bags, frt. allowed ..... 20 1/2  
Nickel chloride, 375 lb drum ..... 27 1/2  
Silver cyanide, 100 oz lots, per oz. .... 67 1/2  
Sodium cyanide, 96 pct domestic 200 lb drums ..... 19.25  
Zinc cyanide, 100 lb drum ..... 47.7

## SCRAP METALS

### Brass Mill Scrap

(Cents per pound, add 1/2¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

|                | Heavy  | Turnings |
|----------------|--------|----------|
| Copper         | 21 1/2 | 20 3/4   |
| Yellow brass   | 19 1/2 | 17 3/4   |
| Red brass      | 20 1/2 | 19 3/4   |
| Comm. bronze   | 20 1/2 | 19 3/4   |
| Mang. bronze   | 18 1/2 | 17 3/4   |
| Brass rod ends | 18 3/4 |          |

### Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

|                   |        |
|-------------------|--------|
| No. 1 copper wire | 19.25  |
| No. 2 copper wire | 17.75  |
| Light copper      | 16.50  |
| Refinery brass    | 17.25* |
| Radiators         | 14.75  |

\* Dry copper content.

### Ingot Maker's Scrap

(Cents per pound, carload lots, delivered to refinery)

|                      |       |
|----------------------|-------|
| No. 1 copper wire    | 19.25 |
| No. 2 copper wire    | 17.75 |
| Light copper         | 16.50 |
| No. 1 composition    | 18.50 |
| No. 1 comp. turnings | 18.25 |
| Rolled brass         | 15.50 |
| Brass pipe           | 16.50 |
| Radiators            | 14.75 |

### Aluminum

|                     |       |
|---------------------|-------|
| Mixed old cast      | 9.75  |
| Mixed new clips     | 11.00 |
| Mixed turnings, dry | 9.50  |
| Pots and pans       | 9.25  |

### Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass  
No. 1 heavy copper and wire. 18 1/2-19 1/4  
No. 2 heavy copper and wire. 17 1/2-17 3/4  
Light copper ..... 16-16 1/2  
New type shell cuttings ..... 16-16 1/2  
Auto radiators (unsweated) ..... 14 1/4-14 1/2  
No. 1 composition ..... 18-18 1/2  
No. 1 composition turnings ..... 17 1/2-18  
Unlined red car boxes ..... 16 1/2-17 1/4  
Cocks and faucets ..... 15 1/2-16  
Mixed heavy yellow brass ..... 12-12 1/2  
Old rolled brass ..... 15-15 1/2  
Brass pipe ..... 16-16 1/2  
New soft brass clippings ..... 16-16 1/2  
Brass rod ends ..... 15 1/2-16  
No. 1 brass rod turnings ..... 15-15 1/2

### Aluminum

|                          |             |
|--------------------------|-------------|
| Alum. pistons and struts | 6 1/2-7 1/2 |
| Aluminum crankcases      | 7 1/2-8     |
| 2S aluminum clippings    | 10 1/2      |
| Old sheet and utensils   | 7 1/2-8     |
| Borings and turnings     | 5-6         |
| Misc. cast aluminum      | 7 1/2-8     |
| Dural clips (24S)        | 7 1/2-8     |

### Zinc

|                    |               |
|--------------------|---------------|
| New Zinc clippings | 13 1/4-13 3/4 |
| Old zinc           | 10-10 1/4     |
| Zinc routings      | 6 1/2-7       |
| Old die cast scrap | 6 1/2-7       |

### Nickel and Monel

|                                |       |
|--------------------------------|-------|
| Pure nickel clippings          | 35-36 |
| Clean nickel turnings          | 35-36 |
| Nickel anodes                  | 35-36 |
| Nickel rod ends                | 35-36 |
| New Monel clippings            | 28-29 |
| Clean Monel turnings           | 20-21 |
| Old sheet Monel                | 28-29 |
| Nickel silver clippings, mixed | 13-14 |
| Nickel silver turnings, mixed  | 12-13 |

### Lead

|                      |           |
|----------------------|-----------|
| Soft scrap, lead     | 15 1/2-16 |
| Battery plates (dry) | 10-10 1/4 |
| Batteries, acid free | 7-7 1/4   |

### Magnesium

|                   |       |
|-------------------|-------|
| Segregated solids | 15-16 |
| Castings          | 14-15 |

### Miscellaneous

|                         |               |
|-------------------------|---------------|
| Block tin               | 100-110       |
| No. 1 pewter            | 80            |
| No. 1 auto babbitt      | 60            |
| Mixed common babbitt    | 16 1/4-16 1/2 |
| Solder joints           | 22-23         |
| Siphon tops             | 21-22         |
| Small foundry type      | 21-22         |
| Monotype                | 18 1/2-19     |
| Lino. and stereotype    | 17 1/2-18     |
| Electrotype             | 16-16 1/2     |
| Hand picked type shells | 10-11         |
| Lino. and stereo. dross | 8 1/2-9       |
| Electro. dross          | 7 1/2-8       |



# Iron and Steel Scrap Markets

## Is Switch to Complacency Too Swift?

**Mills tough on quality, try for cheaper freight rates . . .  
Times have changed quickly . . . Whisper that softer market  
is coming later . . . List stockpiles of steel centers.**

A flash glance at some of IRON AGE district reports on scrap this week could convince an outsider that the scrap market was losing much of its strength. Inspection toughness on the part of mills, reluctance to pay long freight rates, improving scrap stockpiles, and the crash in cast are different tunes than those of only a few weeks ago. Then, the scrap collection tempo was desperate and allocations were eagerly awaited. Now, they are refused on the grounds of freight economy.

The transition from frenzy to complacency came too suddenly, some scrap men believe. The stockpile situation has improved considerably but the ice is still thin. Where is the emphasis to build up the big mounds of scrap that mean safety? Stockpiles have been fattened up considerably—but they were very lean to begin with.

Now there are even whispers that the scrap market will soften further and that in time to come some steel scrap grades will be selling below ceiling. A few scrap buyers are saying nothing publicly but they believe prices were pegged too high by OPS to start with.

Mills are now inspection-conscious. OPS men are abetting this trend. Inspectors are finicky on quality and scrap that would have been welcomed before is in a few cases being rejected and downgraded. Mills are also insisting on the lowest possible freight rates. These are the big ways to cut costs within a controls-bound market.

Pittsburgh mills have stockpiles ranging from 7 to 30 and 40 days—depending on the size of the mill. Cleveland runs about 10 to 20 days, Detroit, 10 to 15 days, and Chicago, about 7 to 15 days.

**Pittsburgh**—On an appraisal basis the cast market is \$2 per ton below the ceiling here. As a practical matter, cast is on a delivered rather than an f.o.b. basis. Not much is moving, but agreement is general that the consumer is in the driver's seat. The turnings market has softened. A mill turned down four cars of machine shop turnings for freight reasons. One consumer is limiting the freight he will pay on good electric furnace material. Another large consumer is talking of limiting springboards on openhearth scrap. Rejections and downgrading are on the increase.

**Chicago**—Openhearth grades continue fairly strong here. There have been indications of weakness in No. 1 bundles, machine shop turnings, and No. 2 bundles. Electric furnace grades show less vigor. Intransit preparation has fallen away, inspections seem tighter. Cast stays feeble. Though some contracts are still being fulfilled, cast items are being offered at below OPS levels. Buying is extremely weak.

**Philadelphia**—Cast grades continue soft and one large buyer came into the market last week and got cupola cast at \$47.50, shipping point. Almost no business is being done in unstripped motor blocks but a sale at \$40, delivered, was reported. Electric furnace grades are in fairly good supply. Openhearths now have the best inventory they've seen for months and are tightening up on quality.

**New York**—Movement of heavier grades of openhearth scrap seems to have improved slightly but not enough to bring forth any cheers. Stories of strict inspections by mills continue. There is some feeling that the scrap market will soften in months to come. A sale of cupola cast was reported at \$47.50 with a maximum allowable freight charge set at \$3.

**Detroit**—Selectiveness and rejections set the stage for rumors that

secondary grades of scrap may go below ceiling prices here. The fact that mills are much more selective and can get almost exactly what they want had the effect of a comparative cost reduction. Cast scrap market continues soft and some grades might go below ceiling if there were offers.

**Cleveland**—Improved inventories at the mills are leading to undue optimism say some sources. It is pointed out that generation of industrial scrap is still declining and mills are still a way off from normal inventories. OPS inspectors here are inspiring more careful grading and some delay in movement. Mills in general don't seem too interested in blast furnace grades. Cast market continues weak.

**St. Louis**—Openhearth movement has improved. Stockpiles are heavier. Mills are tightening up on buying. They are limiting freight to \$4 a ton. Inspection has become more rigid. Some material usually bought by electric foundries are being sold for openhearths. Cast is unwanted.

**Birmingham**—Steel scrap is growing easier. Mills are in better shape, although still receiving allocations. Brokers predict that if scrap continues to come in at the present rate shortages will be licked, at least for the immediate future. Cast scrap has practically no market. Prices drop.

**Cincinnati**—Flow of scrap in the area is very good with mills gaining on inventories. Consumers report being able to pick up more free scrap. Allocations from distant points are being turned down in some cases as a result. Cast grades continue weak in this area with consumers buying only limited amounts, restricting long freight rates and allowing no in-transit preparation.

**Boston**—Below ceiling prices for cast in this district held without change. Some scrap men here hope that the market for cast will improve shortly. Flow of openhearth scrap continues good and all the good scrap that can be generated finds a home.

**Buffalo**—Cast sold at from 50¢ to \$1 below ceilings. Other sales went at ceilings. One mill was low on scrap, but another was comfortable. Some rejections were reported.



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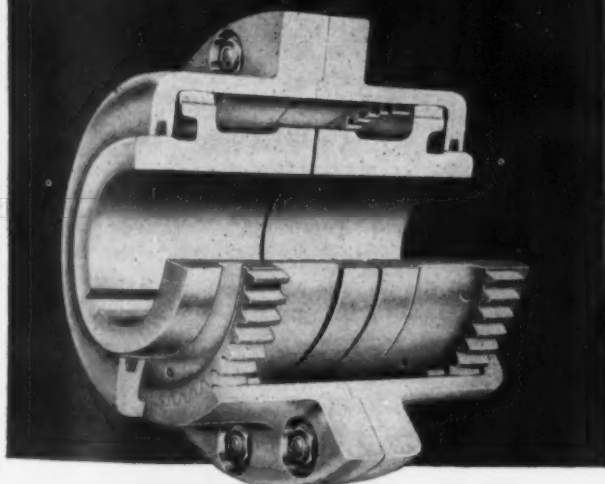
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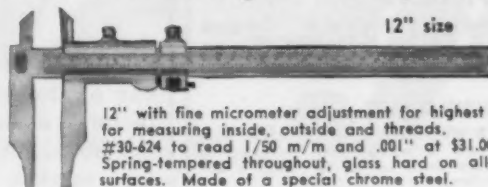
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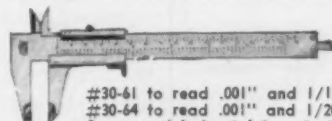
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2" AJAX Upsetting and Forging Machine

### FURNACES—MELTING

400 lb. Moore Type "UT" Melting Furnace Top Charge. Complete with Transformer. New 1943—Little Used.  
15 ton Heroult Model V-12 Electric Melting Furnace, Top Charge hydraulically operated. Complete with Transformer Equipment

### GEAR REDUCER

600 H.P. Farrell Birmingham Herringbone Gear Unit, R.P.M. 7.20 to 74.54 NEW

### HAMMER

10,000 lb. Chambersburg Steam Drop Hammer.

### PLANERS

48" x 48" x 20' Cincinnati, Four Head  
48" x 48" x 12' Niles-Bement-Pond, Four Head  
60" x 60" x 12' Niles-Bement-Pond, Four Head  
72" x 72" x 12' Niles-Bement-Pond, Four Head

### ROLLING MILLS

12 1/2" x 16" Philadelphia Two High Cold Rolling Mill, Complete with Pinion Stand, 75 H.P. Motor 440/3/60. Starter and Controls, Incl. Collar  
18" x 24" Waterbury Farrel Two Stand Two High Rolling Mill, Complete with Elec. Equip.

### STRAIGHTENER

3/4" Shuster Straightening & Cut-Off Machine  
30' Cut-Off, Complete with 15 H.P. A.C. Motor

### TESTING MACHINE

300,000 lb. SOUTHWARK-EMERY Universal Hydraulic Testing Machine

### TRIMMING LINE

#1049 Torrington Trimming Line, With Feed Rolls and Scrap Cutter. Capacity for steel or aluminum alloys 1/4" max. Trimmed width 22" min. 46" max. Scrap Length 3/4" min. 2 1/4" max.

### WELDERS

700 KVA Federal Flash Welder, Enclosed Rim Type, 440 Volt, Single Phase, Ring Sizes 6" to 35" Diameter x 12" Wide  
40 KVA Slacky, Spot Welder, 36" Throat 440/3/60 operation

## ITTERBUSH & COMPANY INC.

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# The Clearing House

## NEWS OF USED, REBUILT AND SURPLUS MACHINERY

**Pittsburgh Market** — Following one of the busiest years in their history, dealers noticed a slight decline in activity during January. The market, however, showed signs of renewed vigor in February but business is still not up to the brisk standard established during last year.

Trading in machine tools in this area is still off slightly in some lines when compared to 1951. Steel mill equipment and electrical equipment continue to move on last year's high level. Actually, demand for electrical equipment of all types is strong. Variable speed motors are also in somewhat better supply. Overall, the trade in the Pittsburgh area looks forward to another good year, although it is questionable whether activity as experienced during 1951 will be equaled.

**Under Cover** — One element which continues to hurt machine tool business is the inability to uncover recent models. Some of the more desperate buyers, however, are offsetting this by taking older machines. Surface grinders are in particularly good demand along with lathes and milling machines.

Another annoying feature of today's market rests in the increasing number of prospective defense producers submitting inquiries. Inquiries are always welcome but in this instance too few result in actual orders. One dealer reports that about 10 pct of his inquiries fall into this category. Evidently what happens, is that the defense contract fails to materialize and the prospective buyer must then drop out of the running. There are other reasons as well but this appears to be the most prevalent.

**NPA Inventories** — Intended to collect statistics on supplies of used metalworking machines, NPA's inventory order is considered by the trade to be of worthy intent. It is further felt that such an inventory recording will prove worthless in the long run. Numer-

ous factors are offered in support of this contention with the most pointed being that a dealer would no longer have a particular tool by the time his inventory record had been screened for prospective purchasers. The Machinery Dealers National Assn. has suggested a reverse procedure whereby requests for machines be made to the government and such lists forwarded to the dealers. This would eliminate filing, screening and recording voluminous inventory reports. However, the trade will still comply with the order hoping paper work will be kept at a minimum.

**New Reasons** — The long awaited OPS price guide is on its way. No publication date has been given but it has been reported that all material is now ready for the printer. It was final correlation of this material which was holding up the presses before; now apparently it is economics. That is the new reason but according to MDNA this reason should not present too much difficulty. Actually MDNA, in attempting to help establish the guide as an aid to the trade, has long offered to carry the burden of publication cost—as soon as the material has been made available.

**Little Change** — In the New York market there would appear to be little change of activity according to reports of several dealers. It is also claimed that the scarcest items on market lists are late type milling machines, radial drills and turrets. Lathes however are reported secondary.

Increasing prospects for subcontracting have brought many small business plants into the market to make inquiries. These are not based so much on actual needs as on type of equipment available if and when they get a likable job to bid on. These small business men tend to be more price conscious whether desired machines are of old or late vintage.